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The New England Obstetrical and Gynecological Society
And The Neisserian Medical Society of Massachusetts

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# The Massachusetts Medical Society

**The next Annual Meeting of the Massachusetts Medical Society will be held in Boston, at the Hotel Statler, June 3, 4, and 5, 1935.**

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# The Massachusetts Medical Society

## SECTION OF SURGERY

**Chamber of Commerce Hall, Worcester, Mass.,
Tuesday, June 5, 1934, 9:15 A.M.**

PRESIDING:
Dr. Ernest M. Daland, Boston, Chairman.
Dr. Joseph H. Shortell, Boston, Secretary.

CHAIRMAN DALAND: The meeting will come to order. Inasmuch as cancer is a disease that is causing the second largest number of deaths in this State, it seemed fitting that we at least have one paper on cancer in this Section. Cancer of the rectum in this State causes about 339 deaths each year out of the 5500 cancer deaths. The first paper is entitled "Cancer of the Lower Colon (Sigmoid) and Rectum", by Dr. Ernest L. Hunt, Consulting Surgeon to the Worcester City Hospital.

DR. HUNT: *Mr. Chairman and Gentlemen*—I seem to have more words than I can crowd into the minutes allotted for presentation of the paper, and so I am just going to try to hit the high spots.

## CANCER OF THE LOWER COLON (SIGMOID) AND RECTUM*

BY ERNEST L. HUNT, M.D.†

WHEN one surveys the general problem of surgery in relation to cancer, one is impressed by the importance of the field indicated by the above caption as a section wherein attack offers much promise of a fair reward for our efforts. Like cancer of the breast its chief promise lies in its accessibility for diagnosis (95 per cent of cancers of the rectum are within reach of the examining finger) and in the progress which has been made toward safer and more efficient operative technic. To this important development several members of this Society have made notable contributions. Dr. D. F. Jones[10d], whom we recognize as an outstanding leader in this development, tells us that "12 per cent of all carcinomata are in the intestinal tract, and of these 70 per cent are in the rectum". He has asserted that the latter may be correctly diagnosed in 100 per cent of the cases presenting themselves.

To those of us who have spent years in public institutional care of the sick there are no sadder memories than of those patients who await the release which only death can bring from the miseries of inoperable or recurrent carcinomata of the lower bowel and rectum. Strive as faithfully as we may in applying palliative measures, the lot of these patients is distressing beyond words and brings to us a clear and definite challenge to apply effectively those measures of relief which have been shown to be possible when predicated upon early recognition and prompt presentation for treatment under conditions which permit of the best service being rendered and for an adequate period of time. What is now greatly needed is the development (in the minds of both laymen and practitioners) of a new point of view as to the relative safety of surgery and the curability of cancer in the above situations by its aid. It is up to the surgeon who would do his part in this work to master the methods, technic and good judgment in their application which have been so well exemplified and so freely taught by the Mayos, D. F. Jones, Miles, Lockhart-Mummery, the lamented Robert Coffey, Rankin, Lahey, Verdi and a goodly company of others.

That present-day practices do not in general measure up to present-day possibilities is evident if we seek information outside of the reports from such highly specialized sources. Thus Vernon David[5] tells us in Lewis' Surgery that in the Cook County Hospital fully four-fifths of the patients with cancer of the rectum are hopelessly inoperable at the time of their admission and the rest are usually on the border-line of operability. From the very center of cancer effort in New England, Hayden and Shedden[9] report from the Huntington Hospital that "77 per cent (or over three quarters) of the cases entering the hospital were considered inoperable, usually because the growth was too far advanced for removal or because the patient

*Read before the Section of Surgery of the Massachusetts Medical Society at its Annual Meeting June 5, 1934.

†Hunt, Ernest L.—Surgeon-in-Chief, Fairlawn Hospital. For record and address of author see "This Week's Issue," page 895.

seemed a poor risk for radical operation." The prospect is brighter among private patients. A sixty per cent operability is probable according to David. Cattell[2] reports from the Lahey Clinic that operability has been 55-60 per cent, in their cases. Miles[15b] reports 32 per cent; Rankin[16c], at the Mayo Clinic, 34.9 per cent; and D. F. Jones[10b], 53 per cent.

It is therefore clear that if half the patients are too far advanced for operative treatment when they come to the surgeon, the possibilities of surgery do not exist for them. If so many are inoperable the chances are that a considerable number of the remainder are border-line cases for whom the surgeon tries to do his best but accepts a high mortality as the cost of his efforts. In perhaps 30 per cent the opportunity is good and the outcome a measure of the skill of the surgeon and the efficiency of his organization. David estimates that of every ten cases of cancer of the rectum but one or two may be expected to survive the five-year period. Dr. Jones shows that it is possible with cases suitable for operation to obtain a five-year survival varying from 40 to 56 per cent according to the type of operation.

In the face of such low operability, high mortality rates may be expected and they range, according to David[5], from 18 to 40 per cent for abdominoperineal resections and 5 to 15 per cent for posterior resections of growths in the ampulla or below. Happily the high mortality rates included in the above estimates, which obtained during the developmental stages of the more radical operations, have now, in the hands of those whose experience justifies the doing of them, been reduced to levels which in the light of the seriousness of the disease are respectable and even remarkable. Thus Coffey[4d] did a series of forty-seven cases with two deaths, and the Lahey Clinic recently reported forty-five cases in series with no deaths.

Among those who survive the operation a higher percentage of five-year cures seems to be offered by radical surgery than by the lesser procedures. It must, however, be borne in mind that three patients who live four years each have totaled more months of life than two patients who live five years. Therefore we must not lose sight of the fact that extension of life and relief of suffering for the largest possible number of human beings is our true objective, rather than a longer extension for a few at the cost of extinguishing life for others, humane as that may seem to those who are familiar with the inevitable miseries of unrelieved cancer of the rectum.

From this brief presentation of the situation it is evident that certain results must be achieved if cancer incidence, morbidity and mortality rates are to be lowered in keeping with the demonstrated possibilities. These have been set forth with clarity and emphasis by Daniel F. Jones and others for the past quarter century. The basis of improvement must be through education in three directions:

(1) Human beings in general must be taught to recognize the importance of initial symptoms of which change of bowel habit, pain and bleeding are the chief, and to seek advice promptly when aware of any of them.

(2) Practitioners must be awakened to the significance of each characteristic symptom and must apply conscientiously the diagnostic methods of abdominal palpation, digital examination of the rectum, microscopical and chemical examination of the dejecta, visual examination by aid of the proctoscope with biopsy studies where specimens are obtainable, and x-ray examination if the lesion is above the reach of the proctoscope. No time should be lost in palliative methods of treatment once a presumptive diagnosis is established. The recognition of precancerous polyps and their effective treatment is no small part of this duty.

(3) Surgeons themselves must master the difficult and time-consuming technique of preparation, operation and after-care of patients having these troubles. I include this with humility feeling strongly that I can account for most of my own fatalities by some avoidable slip in technic or failure to apply efficiently those principles governing preparation and after-care now so well understood and widely practiced.

At the present time one can hardly fail to note evidences that progress is being made along the lines indicated. While the processes of education are slow and wisdom does not always ride in company with knowledge, the strikingly better results obtained by many surgeons in their private patients over those obtained in their ward cases indicate that these teachings have been effective among certain classes and their doctors. During the past year seventy-seven articles on Cancer of the Rectum were found in the literature and few of the writers failed to dwell upon the known factors which are the stepping stones to progress. Recent graduates, as I know them as internes, are far more imbued with appreciation of the proper method of history taking and of examining for these disorders than they were formerly. Prof. G. Grey Turner's prayer that the youth of our profession might apply the teaching of St. Paul and "Condescend to things that are lowly" seems to have been measurably answered.

Now comes our common friend and organizing genius, Dr. Franklin H. Martin, to put before us a new objective, viz., "To establish a universal policy among physicians and surgeons to report cancer cures rather than to pre-

sent the involved comparative statistics that dwell particularly on the cases not cured." In harmony with this thought I desire to present a group of cases some of which have given me the satisfaction of success while others have given me the lessons of failure; all have given me the joy of hard fighting in a good cause.

Among the obstacles confronting the surgeon who would apply a suitable radical procedure is the well-nigh universal horror of an abdominal anus among laymen and physicians alike. It is not in the least uncommon in hospital practice, when one explains to a patient that the proposed operation will involve such a possibility, to get the response, "I'd rather die than have that. My doctor told me never to let them do that to me." This attitude is a severe handicap to the surgeon and has cost many a life. It does not seem justified by the experience of those in whom the colostomy has been properly made and reasonably well cared for. A patient, wife of a brother professional man in another state, upon whom I operated in 1925 (9 years ago), writes me the following:

"In March, 1925, I had a colostomy performed to try to live a little longer. I have found that the care and training one must give to a condition of this kind has much to do with the success of same. In the first place one must be very regular in washing it out at the same time each morning. I try to take about one hour, starting at 9 A.M. with about 2 quarts of warm tap water, a soft rubber catheter and a one ounce glass catheter tip syringe. I lie down with a bedpan under me and start by injecting about 4 oz. of water and wait perhaps 5 minutes. If bowels do not move I repeat the amount of water and wait another 5 minutes; and so on until my bowels have moved sufficiently. Then I clean my side with gauze and warm water and have some gauze packs prepared about 6 in. square well covered with zinc stearate which I place over the artificial anus about two deep, then place a band around that over my abdomen and am ready until the next day at 9 A.M.

"Diet seems to play quite an important part in keeping the bowels correct; plenty of milk, vegetables, meat once daily, etc., and I have been able to go to the races, take long auto trips down South, do my own house-work and am alive to tell the story and have never used a pouch. My weight increased from 95 to 125 lbs. during the first year and has remained at about the latter figure ever since."

Similarly the patient shown in the motion picture (Case 11) finds his colostomy no insurmountable obstacle to normal social and occupational relations.

To teach the acceptability of such an alternative as the price of escape from the miseries of cancer should be an important duty of all who would contribute to this educational program.

The ideal operation is defined by Dr. Claude T. Dixon as "one in which complete removal of the growth is accomplished, normal function is preserved or restored, and recovery is effected." While we may expect to accomplish this in cases wherein the growth is situated at and above the upper half of the sigmoid, it is seldom that it may be wisely attempted when the lesion lies at or near the rectosigmoid or below. Because of its storage function with abundant bacterial flora and the tendency toward obstructive type of lesions to which the left colon is subject, one-stage resection with immediate anastomosis and closure is quite generally acknowledged to be unsafe.

### UPPER SIGMOID GROUP

From the standpoint of symptomatology and of early diagnosis as well as operative handling, growths in the descending and sigmoid colon present problems quite different from those of either the right colon or the rectum proper. It is well-recognized that they may be entirely silent so far as any symptoms go which would excite the patient's curiosity sufficiently for him to seek assistance. Moreover they are all too often considered functional by the medical adviser when his help is sought for constipation associated with colic, or for diarrhea, or for bleeding, these singly or in association. It is in this group that we must seek help from the roentgenologist whenever an adult patient presents any of the above symptoms. Not infrequently their significance may be masked by other and more obvious findings (of which hemorrhoids are perhaps the most common) until the advent of an acute obstructive episode calls for immediate surgical intervention. Case 1 is an instance in which concomitant diabetes was the obscuring factor.

#### CASE 1

J. J. G., single, male, wool sorter, aged fifty-four. Onset with obstruction. Mikulicz resection.

A mild diabetic, he had lived for five years by a strict dietary régime. He was admitted to Worcester City Hospital, July 18, 1923, because of a two-day attack of severe constipation with vomiting, pain in the epigastrium and left lower quadrant. Epsom salts and enemata brought relief. He remained in the hospital ten days during which he was comfortable. He was found to have a positive Romberg sign, B.P. 160/100, slightly increased area of cardiac dullness, transient albuminuria, high blood sugar and no blood in stools.

He again entered November 22, 1923 with a history of increasing constipation, a series of gastro-intestinal upsets with colicky pain and much gurgling, relieved by vigorous catharsis and enemata. Attacks lasted from two to three days. No blood in stools. No vomiting. His last attack, the most severe, began five days ago and was finally relieved by enemata.

Has a right inguinal hernia for which he wears a truss.

Examination: Abdominal at first recorded as practically negative. Later a mass was detected deep in left lower quadrant. X-ray located an annular constriction at junction of colon and sigmoid. Digital examination of rectum was negative.

On December 5 he reported the passing of gas from which he experienced relief. He was transferred to the Surgical Department the following day.

Operation: 12-7-23. Gas-oxygen. Mikulicz resection. Left rectus splitting incision. Growth located four inches below the termination of descending colon and freely movable. A loop of bowel containing the growth was separated from the mesentery and drawn into the wound which was then closed down upon the loop, the edges of the parietal peritoneum being caught to gut above and below by fine sutures. One thousand cc. of saline solution were given subpectorally after the operation.

Five days later the loop was cut away by the cautery and the adjacent walls crushed together by a clamp.

Sixteen days later the everted edges of the bowel were dissected free, edges trimmed and operation completed by closing the gut, pushing it back and closing the abdominal wall.

January 12, 1924, discharged convalescent.

Pathological Report: Sections from the thickened, contracted area of the growth show it to be an adenocarcinoma. There are mitotic cells and much infiltration with polynuclears.

Follow-up: Reported January 4, 1925. Has gained twenty pounds. Still constipated and has jabbing pains in abdomen. X-ray examination by barium enema showed anastomosis clear, but the gut somewhat constricted.

Lost track of since that time. No death certificate on file at City Hall.

*Comment:* This patient's first entrance offered a definite problem which, if it had been followed by a searching roentgenological examination, would doubtless have led to a diagnosis six months before it was actually made. His diabetes was the important feature in the patient's mind and apparently satisfied his doctor.

In the next case the fortunate occurrence of free bleeding persuaded a very conservative patient to seek medical aid. Although the diagnosis was missed by the roentgenologist, exploration was thought to be indicated and determined a favorable outcome for the patient.

CASE 2

D. W., female, aged forty-nine. Pain, bleeding. Mikulicz resection.

Admitted Worcester City Hospital, November 15, 1929.

Symptoms: Pain in right lower quadrant since July (5 months) which gradually disappeared. Catamenia irregular and pain attributed to age period. "Heart-burn" relieved by soda for two years. Moderate constipation for two months readily relieved by laxatives. Had a discharge of bright red blood from rectum which sent her to physician. Is now more easily fatigued than heretofore. Loss of 10 lbs. weight in past four years.

X-Ray Report: G. I. Series: Stomach negative but duodenal bulb is not shown on a considerable series of films. At six hours stomach is empty but none of the meal has reached the cecum. Twenty-four hour examination is negative and shows the colon down to upper portion of sigmoid well outlined with no abnormality. The impression is of a lesion in the duodenum, with question of ulcer.

First Operation: November 16, 1929. Ether. Median incision. Upper abdominal organs negative. Mass in sigmoid. Drew loop into wound and anchored it.

Second Operation: November 18, 1929. Mikulicz resection. Loop of intestine drawn tense, its two ends cut off with the endotherm needle, clamp introduced and compressed. Skin protected with boric ointment.

Third Operation: December 4, 1929. Ether. Closed ends of sigmoid.

Fourth Operation: Sodium amytal, intravenous. Excision of fistula with closure of sigmoid.

Pathological report: Carcinoma of sigmoid. Grade II.

Discharged February 1, 1929. Convalescent. Seventy-seven days.

End Results: Alive and well after four and a half years.

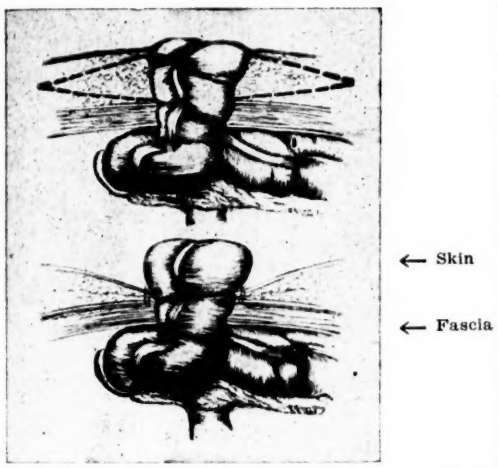
These cases illustrate the use of the regular Mikulicz procedure by which one is enabled to remove the growth and treat the toxemia of obstruction by drainage of the bowel at the same time and through a single incision. For its successful use there must be adequate bowel length above and below the tumor to permit of the extrusion of enough bowel so that the resection will be at a safe distance from the growth and allow sufficient length of the proximal limb so that in the obstructed case Dr. Lahey's method of staggering the open ends may be utilized in order that contamination of the incision may be avoided until healing is well-advanced. It is my feeling that the Mikulicz operation is not generally applicable to cases where the obstruction has developed to the point of marked distention and toxemia. Such a situation, in my opinion, calls for preliminary drainage by cecostomy or a proximal colostomy in order to detoxify the patient, restore the tone of the intestinal wall, and clear the bowel of its infectious contents.

Granting the importance of proximal drainage there is considerable difference of opinion as to location and type. Dr. Cheever has advocated a transverse colostomy to which I see the objections that the cecal reservoir of toxic fluid feces and gas may not be so promptly drained and that its juxtaposition to the field of operation when the second stage is done may be embarrassing. Cecostomy obviates these two objections and, since in obstruction reversed peristalsis obtains, should offer no difficulty in clearing the colon above the obstruction. Lockhart-Mummery[14] ascribes great value to the use of magnesium sulphate solution to effect the liquefaction and discharge of the fecal matter through the cecostomy.

The type of cecostomy is an important matter to decide. Coffey indicates his satisfaction with the Hendon method in which a Pezzer catheter is introduced, held by a purse string, the shaft of the catheter brought through a puncture in the omentum and out through the

abdominal wall, the pull on the shaft of the catheter bringing the cecal wall and omentum into close contact with the peritoneum. Lockhart-Mummery introduces a piece of rubber tubing, snugs down the cecal wall with two rows of purse-string sutures the ends of which are sewed into the fascia drawing the cecal wall against the peritoneum, leaving the incision closed loosely with an iodoform pack surrounding the tube as it passes through the abdominal wall. These methods are favored in order to avoid the necessity of a formal operative closure.

It has been my practice in making cecostomies to draw the wall of the gut well out so that the wound might heal around it before the tube sloughed out and so be protected against contamination. Formal operative closure has been necessary but always easily accomplished. If the fat layer is too thick to allow the cecal wall to come to the surface, it is thinned by undermining it as shown in the sketch.




Cecostomy: A method for reducing thickness of abdominal wall to bring cecal wall well above skin.
A—A wedge of fat is excised from both sides of the incision.
B—The skin margins are sutured to fascia. Angle between wall of cecum and skin is filled with vaseline or boric ointment before gut is opened.

I am persuaded that the Mikulicz procedure lessens the danger of shock and avoids that of intraperitoneal leakage, but am in agreement with Cheever that it introduces dangers of its own besides greatly extending the period of hospitalization.

Having utilized cecostomy for its detoxifying purpose, the Mikulicz may still be used if one is fearful of his ability to carry out safely a resection in continuity.

CASE 3

I. M., female, aged fifty-one. A doctor's wife, acute obstruction. Cecostomy, modified Mikulicz. Constriction of anastomosis. Plastic modification of anastomosis.

Admitted W. C. H. December 30, 1928.

P. I. Was taken violently ill after her evening meal December 28 with abdominal pain and vomiting, having had no premonitory symptoms. Morphine was given by her physician that night. Next day the author saw her in consultation and advised enemata which failed to relieve distention.

P. E. Abdominal distention with palpable coils and gurgling. X-ray for gas showed the large intestine above the colon-sigmoid junction to be much distended.

First Operation: December 30, 1928. Exploratory laparotomy through a median incision. Considerable fluid was evacuated and a lesion felt at the colon-sigmoid. Median incision was closed and a right outer rectus incision made through which the presenting wall of the cecum was drawn into the wound and secured, closing fascia and skin snugly about it. Cecal wall was then clamped and incised, a rubber tube introduced, and the edges snugged down to it by two rows of purse-string sutures. Large quantities of brownish fluid and gas escaped through the tube. Eight hundred cc. of saline were given subpectorally.

After-care: Colon was irrigated daily. Median wound healed by primary union. Patient was on full diet on the seventh day and out of bed on the eleventh day.

Second Operation: Fourteenth day. Through an oblique incision on left side the descending colon was mobilized, mesentery of sigmoid perforated, left branch of sigmoid artery divided, gradually separating upward until a sufficient loop was freed. Colon was then divided between clamps and the sigmoid drawn outward and an end-to-side upper to lower anastomosis made. Mesentery was sutured to parietal peritoneum in such a way as to exclude the anastomosis from the general peritoneal cavity. Sigmoid was then tied off three inches above the anastomosis and the tumor-bearing portion cut away with the cautery. A catheter was slipped into the ligated portion and the wound closed, securing the end of the sigmoid just inside the skin level. Wound drained with rubber tissue.

Pathological Report: Adenocarcinoma. Grade III.

Progress: Patient again made an excellent convalescence. There was slight wound sepsis but patient was out of bed and on full diet on January 27, thirteen days postoperative.

Third Operation: February 7, 1929. Cecostomy closed under local anesthesia.

Progress: It soon became evident that the method of anastomosis at the second operation, however useful it may have been in lessening the hazard to the patient, was a poor method from the point of view of reëstablishing continuity of the bowel. It soon became apparent that the stoma was not functioning adequately.

Fourth Operation: February 13, 1929. Cecostomy reopened.

Discharged to her home March 10, 1929. Sixty-ninth day.

Second Admission: April 7, 1929. Reëntered for the purpose of bettering the anastomosis.

Fifth Operation: Wound was reopened and the bowel freed from its surrounding tissues. A loop of small gut had grown to the anastomosis and was torn in the dissection. This was freed and sutured. The stoma was found to have contracted to a small slit. This was remedied by resecting the angle between the colon and sigmoid, utilizing the anterior wall of the sigmoid limb to close in the slit in the colon, thus greatly enlarging the stoma and closing the bowel.

Again she made an excellent recovery, except for an attack of dysentery about two weeks after the operation.

Discharged May 4, 1929. Twenty-sixth day.

Progress: Patient remained well until September 14, 1929, when she began to have pain which increased in severity followed by nausea and vomiting, not relieved by enemata although they brought good results in fecal matter. By the evening of September 16 she was vomiting copious amounts of intestinal contents and was sent back to the hospital where obstruction to the jejunum by adhesion bands was found and relieved. She returned home October 4, 1929.

End Result: To-day, five and a half years after her resection, she is in vigorous health, an active housewife and an ardent golfer.

*Comment:* I have had much satisfaction from the final outcome of this case, but I have felt that overcaution prompted a procedure which in itself introduced elements of danger as great or greater than those which it sought to avoid. The lesson was learned and was applied with gratifying results to succeeding patients, among whom was the relative of another physician-friend having an almost identical lesion, but which was fortunately diagnosed before acute obstruction occurred.

CASE 4

Mrs. H. G., female, aged sixty-one. Housewife. Cecostomy, Mikulicz. Closure of cecostomy.

Admitted October 23, 1932. Discharged December 11, 1932. Forty-eight days.

C. C.: Constipation for many years. Pain across abdomen in attacks for past year. Laxatives and enemata have relieved her, but have had to be persisted in.
Appetite and digestion are normal in spite of which she has lost 12 lbs.

P. H.: Para iv: three living and well; one died, aged six months.
Operation for uterine polyp and hemorrhoids, 1918.
Perineorrhaphy, 1904.
Appendectomy, 1928.
Fracture right tibia, 1929.

P. Ex.: B. P. 140/50.
No palpable masses in abdomen.
Filling defect in descending colon shown by x-ray.

Blood: Wassermann negative. Coagulation time three minutes. Hgb. 75 per cent. RBC 4,640,000. WBC 8,100.

Urine: Negative.

First Operation, Oct. 27, 1932. Surgical risk A. Cecostomy. Local and G. O. Right lower rectus incision. Old adhesions cleared. Cecum drawn into wound, secured to peritoneum by four O catgut sutures. Skin undermined and fat removed. Skin edges sutured to fascia at sides and to each other at ends. Boric ointment and saline dressing.

October 30: Opened cecum with thermocautery.
Diet: Liquids without residue. Daily irrigations of bowel through cecostomy.

Second Operation: November 10. Resection with end-to-end anastomosis. G. O. and ether. Left outer rectus incision. Found a constricting growth at junction of descending colon and sigmoid. Mobilized same. Resected five inches of bowel and did an end-to-end anastomosis with three rows of O chromic. Mesentery margins sutured to peritoneum.

Third Operation: November 22. G. O. and ether. Dissected cecum from abdominal wall, trimmed edges of the opening in its side, closed them with two rows of intestinal cg., closed peritoneum, muscle, fascia and skin with one small drain down to but not through the peritoneum.

December 11: Discharged. Healed except for serous drainage from cecostomy wound.

December 23, 1932: Left for her home in Maine. Healed. Bowels moving normally.

End Result: Well and vigorous now, one and a half years later.

*Comment:* While this patient was in no sense so ill as the preceding case, the comparison of a forty-eight day stay in the hospital with one of 105 days seems to speak in favor of the shorter method which also avoided the trying necessity of an additional operation for completion of the anastomosis. I also have a strong impression that cicatricial contraction is greater in an extraperitoneal anastomosis.

The next case illustrates the value of the proctoscope as an aid to diagnosis even though the growth was beyond its reach. A careful roentgenological study confirmed the diagnosis and a palliative colostomy was done. Because the growth had been felt to be inoperable the patient dragged along from July to November, yet even then "resection in continuity" was possible and he has lived now for two and a half years, in spite of liberal ingestion of ethyl hydrate in its various forms.

CASE 5

J. J. W., male, aged sixty-four. Colostomy. Resection of colostomy. Murphy button anastomosis.

First admission: June 10, 1931.

P. I.: Lower abdominal pain for eight or nine months, usually after a heavy meal. Sharp but not localized. Chronically constipated and has used many cathartics from which he gets temporary relief.

P. E.: Generally negative. Abdomen is tender in left lower quadrant and deep palpation gives suggestion of an indefinite mass in the area.
Rectal: External hemorrhoids. Symmetrical enlargement of prostate. No nodules or fecal impactions.
Proctoscopic: "The mucous membrane of the sigmoid immediately above the pelvirectal valve and for 1½ in. into the sigmoid was normal. There was, however, some bloody mucus coming down from above."

Blood: Wassermann negative. Hgb. 90 per cent.

Stools: Occult blood positive.

Diagnosis: Cancer above the pelvirectal valve.

X-ray study June 15, 1931: "Enema enters readily as far as the cecum. The sigmoid presents a ragged filling defect of annular type about 7 cm. long with irregular borders on both sides and a much narrowed, tortuous lumen. Just distal to it is a diverticulum and another one is shown in the descending colon which appears spastic.
Diagnosis: Annular carcinoma. In view of the location and presence of diverticula the malignant degeneration of an area of diverticulitis must be considered etiologically."—P. H. Cook.

First Operation: June 30, 1931. A loop of large gut was brought through a left rectus incision and supported outside by rubber tubes passing under the loop.

Discharged July 29, 1931: Discouraged because colostomy bag will not work. Not enough protrusion to prevent leakage.

Second admission: August 7, 1931. Entered because he has liquid stools and finds it very annoying and uncomfortable. A constipating diet and medication were utilized with some success. He remained in the hospital until October 31, 1931, by his own desire.

Third admission: East Surgical. November 23, 1931. Has continual discharge of liquid feces from colostomy. None from rectum although he has a desire to defecate by rectum. Skin is irritated about colostomy and he feels weak. Urine shows no abnormality.
Hemoglobin is down to 60 per cent.

Second Operation: November 27, 1931. Incision carried along either side of colostomy. Skin edges turned in and sutured over the opening. Incision then carried through to peritoneal cavity. Adherent coils of small intestine were separated by sharp dissection and sigmoid exposed, finding a tumor constriction about 2 in. below the colostomy. A segment of gut including both tumor and colostomy was resected and the ends joined using a Murphy button. Wound closed. A McBurney incision was then made on the right and cecal wall drawn into wound and secured. The ends of the incision were closed leaving cecum protruding. Impacted feces having been noted, sphincter was dilated and several hard masses of inspissated feces containing a large amount of barium were removed.

Pathological Report: Adenocarcinoma, Grade III.

Progress: Fourth day: Cecum had retracted into the incision so that attempt to open it failed.

Complication: Developed arthritis in left first metatarsophalangeal joint. Median wound healed. Right wound still open but not discharging feces.

Discharged January 7, 1932: Wounds closed. Arthritis relieved.

Later history: In hospital three times up to September 2, 1933. X-rays reveal a narrowing of sigmoid corresponding to site of anastomosis. Bowels function fairly well. Has had some urinary difficulty and arthritis.

### LOW OR RECTOSIGMOID GROUP

Tumors at the rectosigmoid junction or just above it are generally considered as of the rectum and the operative problems partake of the characteristics of both colon and rectum. The outstanding complaint of these patients is bleeding, alone or in combination with pain, constipation, mucus or neighborhood symptoms. While many of the tumors are sufficiently low to be reached by the examining finger, especially if the patient coöperates by downward straining at the moment of highest insertion of the finger, the proctoscope will generally be required for their identification and is much more reliable than the barium enema for the lesions within its reach. Jones[10b] forcefully says, "If every physician and every surgeon would determine accurately the location of the source of bleeding by digital and proctoscopic examinations, the operability of cancer of the colon and rectum would be greatly increased and the number of actual cures would be high."

In addition to the importance of the proctoscope in enabling one to visualize the lesion, it also enables one to secure a specimen of the tissue for biopsy which, formerly frowned upon, has now assumed a new importance under the impetus given by the Broders system of cancer grading of which Rankin says, "I do not believe that any other advance in pathology in recent years has been so important from the standpoint of prognosis as this significant work of Broders, which has been repeated and substantiated by Martzloff." It has also an important bearing upon the question of operability and of choice of operation best adapted to the case and situation.

If the biopsy shows low malignancy, Grade I or II, and the growth is reasonably high the ideal operation may be attempted with fair hope of success. On the other hand, if the Grade is III or IV, even if the growth is small, any operation other than the most radical procedure consistent with safety is doomed to failure (except as the growth may perhaps be modified by radiation). In the two following cases of anterior resection with reëstablishment of continuity, the difference in the outcome suggests the difference in grade of malignancy as the determining factor.

#### CASE 6

E. T. Female, aged forty-three, single, teacher. Obstruction. Cecostomy. Murphy button anastomosis.

Admitted W. C. H. May 10, 1929, in acute obstruction. She gave a history of having passed blood from time to time for three years. Had a gastro-intestinal x-ray examination in 1926 which was negative. During the past three months had lost nine lbs. in weight. Had had frequent loose stools for three months. No bleeding for four months.

P. I.: For the past week has had generalized abdominal pain with rumbling. Constipated without relief by cathartics. No dejection for past five days with pain increasing. For past two days has been distended. Is nauseated but has not vomited.

First Operation: Two and a half hours after admission. Exploratory laparotomy, discovered a tumor of the rectosigmoid adherent to floor of pelvis. Cecostomy done and midline incision closed.

Second Operation: May 20, ten days later. G. O. and ether. Median incision. Freed the growth from its adhesion to bladder and floor of pelvis. Resected about half the sigmoid. Passed a purse string about the edges of the rectal stump, inserted half of a large Murphy button and drew the purse string tight. Treated the lower end of the upper segment in similar manner and joined the two halves of the button, making a secure closure. Repaired the mesentery and the abdominal wound, except for exit of a Penrose drain. Left an inlying catheter in the bladder and stretched the anal sphincter. Intravenous glucose.

Pathological Report: Adenocarcinoma, Grade II.

Third Operation: Eighteen days later. Gave a little gas-oxygen and removed button which was loose in rectum.

Fourth Operation: Repaired cecostomy under local anesthesia.

Discharged June 30, 1929. Fifty-one days.

End Result: Five years since operation. Well and doing her normal work as a teacher. X-ray shows no constriction or filling defect.

CASE 7

F. R., male, aged forty-six, single. Obstruction. Cecostomy. Resection with Murphy button anastomosis. Recurrence with death two years later.

First admission: Nov. 16, 1931.

P. I.: Pain in abdomen. Three weeks' duration. Cramp-like, low down. Almost constant last two days. No relation to meals. Vomited five times last night. Constipated; distended with gas. No loss of weight.

Occ.: Painter.

P. Ex: Generally negative except for abdominal distention and very slight anemia.
Wassermann negative.

X-ray study: Limited to a flat film for gas. Report: "Much gas in dilated small intestine presenting typical step-ladder pattern. This indicates small intestine obstruction."

First Operation: November 18, 1931. Exploratory laparotomy. Found nodular constriction low in sigmoid and considerable free fluid. Cecostomy. Interval care: Irrigations and drainage successful; finally came through to rectum.

Second Operation: December 7, 1931. Nineteen days after first stage. G. O., ether. Median laparotomy. Superior hemorrhoidal artery tied and divided. Mesentery with contained glands dissected up. Gut divided between clamps just above rectum and again 2 in. above growth. End-to-end anastomosis with Murphy button. Suture of mesentery. Closure with superficial drainage.

Pathological report: Adenocarcinoma, high malignancy, Grade IV. Chronic lymphadenitis.

Progress: Normal wound healing.

Third Operation: December 23, 1931. Seventeen days after second stage. G. O. Cecostomy closed. Button removed from rectum.

Discharged January 5, 1932. Fifty-four days. Symptom-free. Incision healed except a small granulating area.

Second admission: March 23, 1932. Ten weeks since previous discharge.

Constipation, one week. Soreness in sternal region. Pain and stiffness in neck radiating to clavicle. Loss of weight, 5 lbs.

X-ray studies:
(a) Spine: No evidence of metastasis found.
(b) Barium enema: Annular filling defect below sigmoid—colon junction.

Third admission: April 25, 1932.

Metastatic growth above manubrium. Vomiting and abdominal pain.

Operation: Laparotomy in hope of doing a palliative colostomy. Found generalized carcinoma and free fluid. Closed after obtaining specimen for biopsy.

Pathological report: Adenocarcinoma, Grade IV.

Autopsy: May 10, 1932.

Carcinoma, recurrent of sigmoid. Carcinoma of peritoneum, generalized. Carcinoma, metastatic of liver and sternum.

Another case of high malignancy with onset silent until the advent of acute obstruction illustrates the extraordinary vicissitudes which a human being may undergo to purchase a brief extension of life.

CASE 8

G. M., male, aged fifty-two. Obstruction, cecostomy. Resection with Murphy button anastomosis. Obstruction by adhesive bands. Cecostomy. Hernia through cecostomy. Death.

Admitted December 23, 1929.

P. I.: Increasing constipation for one week, obstipation for two days, not relieved by enemata. He became very weak and has vomited brownish liquid about twelve times during past twenty-four hours. There has been no loss of weight or strength up to present illness. No tarry stools. Has had pain in left lower quadrant from time to time. Not troubled with piles.

Ex.: Abdomen: Protuberant, distended, generalized tenderness but no spasm or masses. No visible peristalsis.
Rectal: Prostate enlarged. No other masses felt.
Blood: WBC 15,200. RBC 4,120,000. Hgb. 85 per cent. Wassermann negative. B. P. 116/60.
Heart and lungs negative.

Operation: Three hours after admission.
Explored through median incision. Growth located in pelvis. Cecostomy done and tube introduced through which quantities of liquid feces escaped. Venoclysis during operation. Subpectoral clysis afterward.

Interval Treatment: Glucose intravenously and other supportive measures. Irrigation through cecostomy.

Second Operation: February 3, 1930. Forty-second day. Spinal anesthesia.
Left paramedian incision. Cleared adhesions, freeing up the growth which was of the lower half of sigmoid. Resected sigmoid from 3 in. above growth to a point just above rectum. Anastomosis by Murphy button.

Pathological Report: Adenocarcinoma, Grade III.

February 21: Murphy button passed.

Third Operation: March 2, 1930. Local anesthesia. Closure of cecostomy.

Discharged March 19, 1930.

Later History: November 16, 1931, admitted with acute obstruction.

Fourth Operation: Laparotomy with lysis of adhesions. Nodule felt deep in pelvis.

Fifth Operation: Convalescence interrupted by breaking open of wound with extrusion of intestine. Operative replacement and resuture. Cecostomy reëstablished.

Discharged February 2, 1932, with cecostomy, to care of Cancer Clinic.

Final Entry: February 23, 1932. For several days a protrusion of bowel has been taking place through cecostomy. Recently it has increased in size until discharge of feces from cecostomy has ceased. There is visible peristalsis over rest of abdomen.

Sixth Operation: Immediately. Whole mass resected. Ileum drawn out for an artificial anus. Ascending colon partly closed about catheter. Brought out through upper end of wound.
Died suddenly February 28, 1932.

Autopsy: Adenocarcinoma of sigmoid, recurrent.
Adenocarcinoma of liver, metastatic.
Paralytic ileus.
Peritonitis localized in right lower quadrant.

Such a battle for life as this poor man went through is appalling. Be it said to his honor that he bore all with fortitude and never-failing appreciation of the attention he received. The final episode of extrusion of bowel through the cecostomy suggests as a good rule of practice that the cecum is not a suitable point for a colostomy that is intended to be permanent, because the smaller and mobile ileum may readily intussuscept and work its way through the stoma. Similar mishaps may result if the slack above a transverse or sigmoid colostomy is not taken up before the bowel is fixed in the abdominal wall. I recall an unpleasant lawsuit brought by a patient against a surgeon who had done a transverse colostomy for an obstructive growth of the distal colon because she was troubled by the prolapse of about four inches of intestine which hung as a pendant from the belly wall. It was certainly a repulsive thing to look at and the misery that it caused her overcame the patient's gratitude for the service rendered by her surgeon.

If the slack is taken up and in case of the upper sigmoid the cut edge of its mesentery sutured to the parietal peritoneum as advised by Rankin, both inversion of the sigmoid and pocketing of the small gut around the attached limb of the sigmoid will be avoided.

The initial successes in these three cases led me to try a fourth, a woman of seventy, by the Murphy button method with disastrous result as there was too much fat for proper approximation of the segments of the button. A fifth patient done by the Balfour tube invagination method, though immediately successful was followed by early recurrence and death in about six months. These were discouraging, particularly as the fatal case was again a relative of one of my brother physicians. To the next case I applied the more radical method of removal of the sigmoid, except enough of the upper end to make a permanent colostomy, leaving the lower end of the rectum in situ.

### Case 11

F. W., male, aged forty-three. Obstruction, partial. Anterior resection.

Admitted W. C. H. October 7, 1932.

C. C.: Abdominal pain.

P. I.: Accident in February, following which he became increasingly constipated. Listless until he obtained movements with laxatives which would cause considerable pain, but afterwards he would feel fine again until the next period of constipation. These episodes have increased in frequency and pain in intensity until the present. Pain is intermittent and located in low middle of abdomen. Passing of gas or a dejection relieves for the time being. There have been no bloody or tarry stools. Appetite has begun to fail and he has lost 30 lbs. weight.

Occupation: Delivery clerk. Drives truck.

Ex.: B. P. 118/78. Pulse 86. Temp. 97.6°.
Urine: No albumin or sugar. Phthalein 50-15 per cent.
Blood: WBC 7,000. RBC 4,680,000. Hgb. 80 per cent, Wassermann and Kahn negative. Blood sugar 100 mgm. N. P. N. 35.3 mgm. Creatinin 1.5 mgm.
Glands: No glands palpable in neck or groin.
Mouth: Teeth false.
Chest: Right chest shows area of increased density at apex. No râles.
Heart: Regular. No murmurs. Not enlarged.
Abdomen soft, no tenderness. Feeling of fullness in r. l. q. with movable gas in gut.
Rectal: Digital examination locates a mass lying above prostate, immovable, non-tender. Cannot feel it in lumen of bowel but through bowel wall.

Treatment: Liquids without residue. Irrigation of rectum.

Operation: October 10, 1932: Low median incision, found mass occupying right side of pelvis which was densely adherent to posterior bladder wall. Found lines of cleavage and separated it, liberating a small collection of pus in so doing. The mass was found to occupy about the middle portion of the sigmoid. Gut was freed by incising peritoneum about it, then dividing it between clamps, dissecting and dividing mesentery and clearing hollow of sacrum. Rectal stump was closed by inversion and sutures, peritoneum sewed over it, continuing over stump of mesentery, including the end of a Penrose drain which was anchored by an O plain suture.
A second opening was now made in the abdominal wall at outer margin of left rectus. The muscle was split, tying the deep epigastric vessels. Upper segment of bowel still clamped was pushed out through this opening, secured by two sutures of O chromic catgut, the skin margins sutured to fascia margins and appendices epiploicae trimmed from extruded portion. The skin was protected by boric ointment and the gut by sponges wet with saline. The clamp was removed and replaced by a ligature of tape. Median incision closed except for exit of the Penrose drain.

Pathological Report: Adenocarcinoma, Grade II.

After-Care: Food by mouth withheld for forty-eight hours. Five per cent glucose in saline given intravenously twice daily.
Colostomy opened third day.

Progress October 26, 1932: Surrounded extruded portion of intestine with Thiersch's grafts.

Progress November 11, 1932: A prolapse of colon through colostomy of about 2 in. having occurred, the redundant portion was amputated by the endotherm knife, bleeders tied and adjacent walls sutured together, serosa to serosa, with O chromic catgut.

Discharged November 19, 1932: Forty-third day. Healed and is taking a normal diet.

End Result, May, 1934: Has not lost a day's work since resuming January 7, 1933. Has regained his customary weight. Wears "Grenfell" type of colostomy bag and, save for the morning irrigation and occasional stop to empty bag and cleanse anus, has no trouble from it. Is conscious of stump of rectum just before defecation issues from the artificial anus, otherwise it is silent. Digital examination finds a blind sac with no ulceration or induration.

LOW RECTAL GROUP

From my limited experience I derive a very distinct impression that the lower the growth the more formidable becomes the operation which must be done for its relief. I should except from this statement growths of low malignancy in the ampulla that are discovered early enough for some type of local resection which does not involve removal of a complete circumferential segment of the bowel. In the present state of practice such cases are rare.

In regard to the run of low rectal cases as they now present themselves my feeling has grown that the more radical operations offer the best chance of deferring the fatal issue from recurrences, and, by increasing the ratio of those who ultimately succumb to internal metastases over those of local recurrence, they count on the side of humane service. The steadily decreasing mortality rates of such operations, in the hands of the specially skilled, commands our admiration and excites our hope. It is necessary, however, that we realize the cost by which a surgeon attains the high degree of skill essential to reasonable primary mortality rates and let prudence season enthusiasm as "mercy seasons justice". Verdi well expresses this thought: "An operation for cancer, regardless of the position in the body, should be made as complete as the exigencies of the case will allow."

For myself I have been obliged to confine my efforts to the simpler types of operation as my series has been small. Dr. Evarts Graham in an editorial note following a review of a paper by Rankin says: "It has seemed for many years that in cases in which the growth is located below the reflection of the peritoneum the Lockhart-Mummery operation of perineal resection, preceded by an abdominal double-barrelled sigmoidostomy, is the operation of choice because of its very low mortality." For his operation Lockhart-Mummery records seven per cent primary mortality and fifty-two per cent five year cures.

In my hands the mortality has not been low but my experience has been too small to justify any dogmatism. I have chosen to do it because it seemed likely to be safer in my hands than the combined abdominoperineal resection. As a surgical procedure the plan of leaving a blind end of gut below the colostomy does not appeal to me so that in the few such operations I have done I have tried to save enough sigmoid to bring the end out to the surface for a perineal anus in order that the distal segment of the gut might be kept clean. Two died in the hospital and two are living, one apparently without disease, the other under suspicion of recurrence but still in good general health and without symptoms. The former had preliminary treatment by a radium pack. The latter's tumor was of high malignancy so that my expectations for her are not high.

CASE 13

W. W., aged sixty-nine, male. Colostomy, posterior resection. Radium preparation.

Admitted January 12, 1932. In 1916 had a gastroenterostomy for ulcer by Dr. Gage. Right-sided hemiplegia 1898, 1899, 1900. Fracture of neck of left femur six months ago. Healing with stiff hip. Constipation for five weeks. Pain with defecation. Frequent desire but little product of pencil stools, blood streaked. Second week loose stools with bright red blood. Third week constipated again with pain and desire for dejection. No abdominal distress, pain or vomiting. Loss of appetite. Loss of 25 lbs. weight.

Ex.: Left leg shortened, internally rotated, hip stiff; atrophy of muscles.

Rectal: On posterior wall is an indurated fungating mass with crater which bleeds on touch.

X-ray: Showed pyloric stenosis. G-E. stoma functioning well. Came in for this study and discovery of rectal tumor was incidental.

Radium: Five hours' exposure to radium pack by Dr. P. H. Cook.

First Operation: February 5, 1932. Loop sigmoidostomy, left, supported by bridge of muscle and fascia.

Second Operation: February 9, 1932. Opened loop.

Third Operation: Resection of anus and rectum. Lower end of sigmoid brought down to form new anus in former site of coccyx.

Pathological Report: Adenocarcinoma, Grade II.

Discharged June 5, 1932.

Reëntered October 3, 1932: Prolapse of bowel through colostomy. Amputated.

Recent History: Has irrigations of distal segment about twice weekly by district nurse. Colostomy functions well and could be closed if he were younger. Digital examination through new anus finds no evidence of recurrence.

CASE 14

O. B., female, aged thirty-nine. Colostomy. Posterior Resection.

Admitted May 4, 1933, with chief complaint of bleeding from rectum of seven months' duration.

P. I.: Patient was perfectly well up to latter part of November 1932 when she developed a diarrhea and had a bloody discharge from the rectum at the same time. The diarrhea cleared up after a few days, but the patient has had an almost constant bloody discharge or blood-streaked stools since onset. She has taken cathartics for years for constipation. Weight has not varied more than two to three pounds for past year. Appetite good.

G. U.: Nocturia two to three times; frequency during the day since last November. No dysuria or hematuria.
Patient states that when she stands up for any length of time she has the feeling that her rectum is falling out. Is also troubled with gas pains.

P. E. Essentially negative with following exceptions. Reflexes: K. J., A. J., and biceps hyperactive. Abdominal reflexes absent. Suggestive Babinski. No ankle clonus.
Rectal examination: External orifice has rigid annular cicatricial ring. Marked tenderness in-

side rectum; soft boggy tissue felt. Examining finger covered with blood.

X-ray Report: May 2, 1933. "Filling defect in rectum just inside the internal sphincter on left lateral wall corresponding to a mass palpable by digital examination. No other defects noticeable in colon. Findings are those of carcinoma." Dr. C. E. Dumas, Roentgenologist.

Diagnosis: Carcinoma of rectum.

Operation: First-stage sigmoidostomy.

Progress Notes: May 8, 1933. Colostomy opened to-day and patient is expelling gas through tube relieving distention. Has no pain. General condition quite good.

May 11, 1933: Patient has no complaints. Eating and sleeping well. Glass tube out and patient expelling gas through colostomy opening.

May 14, 1933: Opening in colostomy irrigated with saline. Very little discharge on dressing.

May 16, 1933: Allowed out of bed.

May 20, 1933: Patient quite comfortable.

Discharged with colostomy pouch in place.

Readmitted August 6, 1933.

Operation: Resection of rectum, posterior.

Laboratory Reports: May 13. W. B. C. 16,400—May 21. Urine: Yellow, cloudy, neutral, 1.004, sug. neg., alb. med. trace. Many RBC and WBC.

Pathological Report: "Gross: Portion of rectum 6 in. in length, wall of which is thickened .8 to 1.5 cm. Inner side ulcerated with depressions filled with gelatinous material. Line of section (upper) appears to pass through edge of growth on one side. Diagnosis. Colloid carcinoma." Dr. R. H. Goodale, Pathologist.

Progress Notes: August 11, 1933: Rubber dam removed. Patient complains of much pain and is incontinent of urine.

August 14, 1933: Perineum has broken down and is sloughing. Silkworm gut sutures removed. This gave patient some relief. Is voiding voluntariiy large amounts of urine so that catheterization is not necessary. Is running a temperature between 100-102°.

August 20, 1933: Temperature has dropped considerably for past three days, ranging between 99-100°. Wound appears somewhat healthier.

August 24, 1933: Discharged, condition improved. There is still a large opening in perineum, but it is now clean. Patient is sitting up in chair without any ill effects. Has no pain or discomfort. To be under physician's care at home.

May, 1934: Has gained 50 lbs. Perineal incision firmly healed. Colostomy functions well.

It is my strong feeling that such operations are destined to be replaced by some type of two-stage abdominoperineal resection of which that of Lahey appeals to me strongly. It makes an end rather than a loop colostomy and allows time for the alimentary tract to readjust itself to the new exit; affords opportunity to detoxify the system and to cleanse the affected portion of the gut; includes in the tissues removed the lymph glands both above and at the sides; protects the general peritoneal cavity; clears the growth by a good margin, and leaves nothing behind to cause sloughing or to grossly contaminate the wounds.

### Case 18

W. R., female, aged sixty. Widow. Radium implantation. Resection per vaginam.

May 8, 1933.

C. C.: Pain in rectum with constant desire to evacuate but passes only gas and free fluid. No good dejections. Has seen blood occasionally.

P. I.: This symptom began about five months ago. She had had an attack of "dysentery" in October 1932, eight months ago. Has high blood pressure, slight dyspnea and edema of feet which subsides at night. Now weighs 176 lbs. which is a drop of 20 lbs. within about a year. Appetite is good. Sleeps well.

P. H.: Passed menopause at fifty-four. Had colitis one and half years ago.

P. Ex.: Short, stout woman with somewhat flushed face. B. P. 244/112 P. 92. Lungs negative. Heart has soft systolic murmur at base not transmitted. Sounds sharp and distinct. Slight puffiness of ankles, but no real pitting. Abdomen soft; no masses.

Rectal: On right anterior wall of ampulla is an elevated growth one half inch thick, one and a half inches wide and two and a half inches long with an ulceration extending longitudinally. It is movable and can be felt through the vaginal wall.

May 23, 1933: Radium. Nine platinum seeds of 3.09 millicuries each implanted through proctoscope, six along margins and three into growth as advised by Dr. Joseph Muir.

June 21, 1933: There has been considerable shrinkage of tumor which is not tender. A small amount of mucus comes away on the finger.

July 12, 1933: Considerable local pain. Tumor about one half its original size but bleeds when rubbed by speculum. B. P. 220/110 weight 162 lbs. Is particularly annoyed by a severe pain radiating to inner side of right thigh.

August 2, 1933: Radium: Four more seeds of 2.90 m. c. each implanted at the corners of a rectangle, the sides of which touch the margins of the growth.

September 11, 1933. Operation: Spinal anesthesia, supplemented by chloroform drop. Patient in lithotomy position, sphincter dilated, gauze pack introduced into recto-sigmoid well above growth, rectum painted with mercurochrome 2 per cent sol. Perineum split. Vaginal wall dissected laterally and upward separating it from the rectal wall to which it was quite adherent by an old scar. Anterior and right lateral aspect of rectum freed and brought into wound. That portion of the rectal wall bearing the growth was now excised and the rectal wall sutured which considerably narrowed the lumen, but left a canal which readily admitted the forefinger. Perineum and vaginal wall were repaired closing the cut sphincter with deep sutures of chromic catgut. One small drain was left in the space between rectal and vaginal wall emerging in front of the perineum.

Pathological Report: Adenocarcinoma of rectum (grade II malignancy).

September 19, 1933: Discharged.

After History: A small rectovaginal sinus remains along drainage tract but causes no trouble. Bowels move regularly. All symptoms relieved. Patient has enjoyed herself all winter in her usual way and is very grateful. No recurrence evident to local examination.

February 25, 1933: Developed edema about right nipple with mass in central portion of gland. X-ray therapy by Dr. P. H. Cook and observation to April 6 when small glands were palpable along margin of pectoralis major.

TABLE I

Dr. E. L. Hunt

CASES OF CANCER OF THE SIGMOID AND RECTUM

1924-1933 Inclusive

| Location of Tumor | Operation Type | Grade of Malignancy | Case No. | Patient | Age | Sex | Hosp. Days | Immed. | Result Later | Duration of Follow-Up |
|---|---|---|---|---|---|---|---|---|---|---|
| High Sigmoid | Mikulicz | I | 1 | J. J. G. | 54 | M | 37 | | Lost track of | 1 yr. |
| | | II | 2 | D. W. | 49 | F | 73 | | Alive and well | 4½ yrs. |
| | Preliminary Cecostomy, Mikulicz, mod. | II | 3 | I. M. | 51 | F | 105 | | Alive and well | 5½ yrs. |
| | Colostomy and Resection, End-to-End Anastomosis | I | 4 | H. G. | 61 | F | 48 | | Alive and well | 1½ yrs. |
| | | III | 5 | J. J. W. | 64 | M | 45 | | Alive (alcoholic) | 2½ yrs. |
| Low Sigmoid (Recto) | Preliminary Cecostomy, Resection with Anastomosis | II | 6 | E. T. | 43 | F | 51 | | Alive and well | 5 yrs. |
| | | IV | 7 | F. R. | 46 | M | 54 | | Dead, recurrence | 6 mos. |
| | | III | 8 | G. M. | 52 | M | 78 | | Dead, recurrence | 2 yrs. |
| | | III | 9 | N. W. | 56 | F | 57 | | Dead, recurrence | 6 mos. |
| | | II | 10 | H. W. | 70 | F | 20 | Dead | | |
| | Permanent Colostomy with Anterior Resection | II | 11 | F. W. | 43 | M | 43 | | Alive and well | 1½ yrs. |
| | | II | 12 | C. L. | 59 | M | | | Dead, recurrence | 2¾ yrs. |
| Rectal | Permanent Colostomy with Posterior Resection | II | 13 | W. W. | 69 | M | 176 | | Alive and well | 2 yrs. |
| | | IV | 14 | O. B. | 39 | F | 34 | | Alive and well | 1 yr. |
| | | II | 15 | G. S. | 58 | F | 23 | Dead | | |
| | Local Resection | II | 16 | G. S. | 70 | M | 71 | | Dead, recurrence | 1 yr. |
| | | II | 17 | L. E. L. | 61 | F | 32 | Dead | | |
| | Local Resection, Radium Prep. | II | 18 | W. R. | 60 | F | 9 | | Alive and well | 8 mos. |

April 23, 1934, Operation: Chloroform-ether sequence. Amputation of right breast with dissection of axilla. Pathology: Adenocarcinoma. Patient again made an uneventful recovery. At date of this paper has resumed her usual way of living.

This last case is in some ways the most interesting of all. Discovered fairly early, the growth corresponded in extent to Duke's classification A, in malignancy to Broders' Grade II but in a patient who would be classed as a "C" surgical risk because of a blood pressure of 220 to 240.

Implantation of platinum-filtered radium seeds had a positive effect in reducing the size of the growth. The location on the anterolateral wall permitted its easy removal by splitting the posterior vaginal wall including the perineum and sphincter ani, excising the growth with a liberal margin of rectal wall, and closing by suture. She was kept on so-called rectal diet for a week and healed nicely, recovering the use of her sphincter satisfactorily. Within six months she was back in the hospital with an adenocarcinoma of the right breast, the cell type being that of the mammary gland.

What is the alteration in normal physiology that permits the development of two distinct types of malignant disease in the same individual? Shall we suppose it an attack by two separate aggressors or shall we attribute it to a breakdown of the normal defense mechanism? The answer, when found, will perhaps remove the field of cancer from the domain of surgery.

Of the place of radium in cancer of the rectum one can but say that it is an occasional aid. The newer types of emanation "seeds" screened with gold or platinum make possible a direct attack upon the growth and the lymphatics in its immediate vicinity when "planted" by the technique described by Binkley. This appears to be a rational method and were it less expensive would, I believe, receive wider application. Certainly it had a definite effect upon the growth in Case 18 after which excision was a simple matter.

Sir Charles Gordon-Watson[7] after an experience of 200 applications sums up the place of radium thus: "Speaking broadly, the best field for radium in the light of our present knowledge is the conversion of a fixed inoperable growth into a less fixed growth which becomes suitable for radical excision."

If a small growth can be made smaller as occurred in my case, especially if the lymphatics are sealed, extirpation would seem to have a better chance of success than is otherwise the case. May we not wish a God-speed to the radiologists on their journey toward such a goal.

For the sake of completeness I include tabulations covering all cases with end results so far as known to me.

Protocols of the fatal cases are omitted unless illustrating some phase that I suppose may be helpful to others in avoiding similar pitfalls.

TABLE II

CANCER OF SIGMOID AND RECTUM

Personal Cases Operated Upon 1923-1933

| | | |
|---|---|---|
| Total Cases | 18 | |
| Primary Mortality | 3 | = 16.7% |
| Cases Surviving Operation | 15 | = 83.3% |
| Deaths from Recurrence | 5 | = 27.8% |
| Lost Track of after 1 Year | 1 | |
| Now Living without Recurrence | 9 | = 50.0% |

TABLE III

CANCER OF SIGMOID AND RECTUM

Palliative Operations

| Operation | Died in Hospital | Died Soon After Discharge | Not Traced | Total |
|---|---|---|---|---|
| Exploratory Only | 3 | 1 | 1 | 5 |
| Exploratory and Colostomy | 1 | 1 | | 2 |
| Colostomy | 4 | 1 | | 5 |
| Colostomy and Radium | | | 2 | 2 |
| Incision and Drainage | | 1 | | 1 |
| No Operation | 1 | | | 1 |
| Total | 9 | 4 | 3 | 16 |

CONCLUSIONS

1. The surgical treatment of cancer of the colon and rectum has been so developed that a much higher rate of curability and lower operative mortality are demonstrably possible.

2. A much greater curability awaits a more universal recognition of the foregoing facts and a wider application of modern diagnostic methods.

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APPRECIATION

The motion picture began in a generous effort by Dr. Francis D. Hart to make films of each member of the staff at Worcester City Hospital in some characteristic work. It happened that my turn came while doing a resection for cancer of the rectosigmoid; as the case made a good recovery and had excellent success in managing his colostomy it occurred to me to bring it up to date by filming the patient as he now is, hoping that it may disarm in the minds of some the dread of a colostomy.

My thanks are due to Dr. Hart for the film and to Dr. Raymond H. Goodale for reviewing the histological slides and grading them according to the Broders system.

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## DISCUSSION

CHAIRMAN DALAND: The discussion of this interesting paper will be opened by Dr. Frederick B. Sweet, of Springfield. The discussers will be limited to five minutes each. Is Dr. Sweet here? Evidently he is not. Then we will hear from Dr. Benjamin H. Alton, of Worcester.

DR. BENJAMIN H. ALTON: *Mr. Chairman and Gentlemen*—I very much enjoyed what Dr. Hunt had to say concerning the subject in hand. I am sorry he was unable to read the whole of his paper as I am sure it would have brought forth many interesting points. It seems that our greatest problem in clinical medicine to-day is cancer, and the relative frequency that we find cancer involving the colon offers the surgeon the opportunity of performing large resections without impairment of health or function with a reasonable assurance that a fair percentage of permanent cures will be his reward.

The operations on the colon consist of the radical and palliative. In the non-obstructive type considerable time should be allowed in preoperative treatment, at least five to seven days. During this time the patient is resting but not necessarily confined to his bed. The patient is given a high caloric, non-residue diet, forced fluids with sugar, an intravenous or clysis of glucose in saline solution once daily, a saline laxative twice daily and a soapsuds enema once daily. If the patient is anemic, a blood transfusion is given one or two days before the operation and in most cases one is given immediately following the operation.

When the exploration is done and no distant metastases are found, a radical excision is performed. At the same time a vent is made by means of a colostomy or a cecostomy. Should distant metastases exist, then a radical operation might be questionable. However, if other things are equal it might be the better judgment to remove the growth to decrease the loss of blood, absorption of toxins and infection.

In the obstructive type the patient must be prepared quickly for an exploratory operation. The stomach should be washed and the exploration performed, preferably under spinal anesthesia.

If the condition of the patient permits, a resection should be done, otherwise a colostomy should be made and the lesion removed at a later date when the general condition is improved.

In regard to cancer of the rectum, at the Memorial Hospital we follow the technique of the combined abdominoperineal resection either in one or two stages. We believe that we are justified in doing a radical operation even though there are distant metastases present.

To obtain good results in surgery of the colon there must be drainage of the bowel to prevent a blowout at the suture-line, adequate blood supply to the area of anastomosis and the absence of infection.

CHAIRMAN DALAND: The paper is now open for general discussion. Will each man who speaks give his name and his residence before making his remarks. Is there any general discussion?

DR. H. K. SOWLES, Boston: There are one or two technical points that came to me while Dr. Hunt was reading his paper. He spoke of one man who had trouble with the lower loop or the double barrel colostomy becoming filled with feces. That difficulty can be overcome if care is taken to cut through the loop which is outside of the abdominal wall so that there are two distinct openings, the upper loop and the lower loop. Even then there may be a little tendency for the fecal material to go into the lower loop but that will not happen to a great extent.

The other technical point which he spoke about was the question of cecostomy. Dr. Hunt's procedure of taking the cecum outside the abdominal wall is of course ideal, but in many cases, as he mentioned, the problem of intestinal obstruction has to be dealt with as well as the carcinoma, and if we have a tremendously distended cecum it is impossible to bring that cecum outside the abdominal wall, and therefore it must be sutured underneath the abdominal wall.

There is one advantage in this procedure: that, after the resection is done, the cecostomy will close spontaneously, and in cases where the cecum was taken outside the abdominal wall, that must be closed by a secondary operative procedure. To be sure, this is a minor operative procedure but it can be avoided. So, in spite of the fact that you are apt to have infection, I prefer to have the suture

underneath the abdominal wall rather than bring it outside.

CHAIRMAN DALAND: Is there any further discussion? If not, Dr. Hunt, do you want to add anything?

DR. HUNT: I am indebted to Dr. Alton for supplying some of the matter which I did not have time to touch upon. I think it is important that we use spinal anesthesia in these cases wherever possible. The patients stand operation very much better than under a general anesthetic. Transfusion is a great help after any of these rather prolonged operations; and transfusion is indicated, anyway, because we are bound to lose more or less blood in doing them.

I quite agree with Dr. Soule as to the desirability of cecostomy done by the Hendon or a similar method, if it is safe, because these operations are multi-stage procedures and unnecessary stages should be avoided and yet I quite agree with the proposition of Dr. Lahey, who said yesterday that the primary thing in all surgery is to have the patient come through alive. We can subject ourselves to a good deal of disagreeable detail with complacence if we are going to get a live patient. I think even in cancer it is a little hard for us to let the patient die.

One case I did not have time to speak of, the last case on my list, would have been very interesting to you in that it was the first case I have ever seen, which could properly be handled locally. It happened to be in an elderly lady who had a very high blood pressure, and consequently was not a good subject for radical procedure. The tumor was on the anterolateral wall; I treated it first with platinum filtered radium seeds, planting nine of those about the periphery and down the middle of the growth as described in the paper. There was a marked shrinkage in the size of the tumor. About three months later I gave her a second radium implantation of four seeds, and about a month later excised the growth by splitting the rectovaginal septum completely, trimmed out the cancer, and sewed up the rectal wall, getting a long, narrow canal, but one which would amply accommodate one's finger. The patient was out of the hospital in ten days and was soon as comfortable and happy as ever. The place of radium in cancer of the rectum is perhaps not yet settled, but experience seems to show that it may be very useful as a preparatory treatment. Thank you.

CHAIRMAN DALAND: Some new things in medicine are discovered quite by accident; others are discovered by repeated experiments. We are going to hear to-day about a subject discovered by careful clinical observation of a large group of patients over a number of years, followed by laboratory study. The work of Doctors Blumgart and Berlin is of great interest because of their approach to the subject. The clinician and internist devise a new scheme and call in the surgeon to help them put it into operation. The next paper is entitled "Treatment of Angina Pectoris and Congestive Failure by Total Ablation of the Normal Thyroid Gland," by Drs. David D. Berlin, H. L. Blumgart, A. A. Weinstein, J. E. F. Riseman and David Davis. We will first hear from Dr. Berlin.

# TREATMENT OF ANGINA PECTORIS AND CONGESTIVE FAILURE BY TOTAL ABLATION OF THE NORMAL THYROID GLAND*

## XV. With Particular Reference To Surgical Technique and Summary of Results In Rheumatic Heart Disease

BY DAVID D. BERLIN, M.D.,† H. L. BLUMGART, M.D.,† A. A. WEINSTEIN, M.D.,† J. E. F. RISEMAN, M.D.,† AND DAVID DAVIS, M.D.†

IN the course of the past eighteen months, seventy-five patients with various types of chronic heart disease have been treated at the Beth Israel Hospital by total ablation of the normal thyroid gland[1, 2, 3]. In an attempt to reduce the operative mortality and postoperative complications to a minimum, anatomical and surgical studies have been made of the parathyroid bodies[4] and the recurrent laryngeal nerves[5]. The value of various anesthetics has also been studied. As a result of these studies, improvements in surgical and medical management have been effected[6] and the last thirty-six consecutive operations on patients with chronic heart disease have been performed without mortality. Three surgical problems in the technique of the operation are of particular importance. These are concerned with the parathyroid glands, the recurrent laryngeal nerves, and the problem of total extirpation of the thyroid with special reference to the adherent zone[2].

*The Parathyroids.* Although the incidence of parathyroid tetany in the usual subtotal thyroidectomy is negligible, it was feared that any attempt to extirpate the normal thyroid gland completely would result in so great an incidence of severe tetany as to make the operation impracticable. For this reason, prior to the first attempted total thyroidectomy for the treatment of heart disease, detailed observations on the location and distribution of the parathyroid bodies were made for some time in the dissecting laboratories and in the autopsy rooms. In this study of twenty cadavers particular attention was paid to the identification and preservation of the parathyroids. The fresh material in the autopsy room offered more helpful information

*From the Surgical and Medical Services of the Beth Israel Hospital, Department of Surgery, Tufts College Medical School, and Department of Medicine, Harvard University Medical School.

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†Berlin, David D.—Instructor in Surgery, and Assistant Professor in Anatomy, Tufts College Medical School. Blumgart, H. L.—Visiting Physician, Beth Israel Hospital. Weinstein, A. A.—Intern in Medicine, Beth Israel Hospital. Riseman, J. E. F.—Assistant in Medicine, Beth Israel Hospital and Harvard Medical School. Davis, David—Assistant in Medicine, Beth Israel Hospital and Harvard Medical School. For records and addresses of authors see "This Week's Issue," page 895.

than that obtained from the formalinized distorted structures visualized in the anatomical laboratories. To gain further experience in the accurate recognition of the parathyroids and to differentiate them and the neighboring lobules of fat and thyroid tissue which they so closely resemble, bits of tissue, thought to be parathyroids, were removed and submitted to our pathologist, Dr. Monroe J. Schlesinger, for histological confirmation. Tissue suspected of being lobules of fat or of thyroid was likewise submitted for identification. At first, errors in diagnosis made in the dissecting room were not uncommon. It was only after repeated trial and error that sufficient experience was gained in the identification of parathyroids to warrant sufficient confidence to attempt the operation of total thyroidectomy in man without the fear of the development of intractable tetany.

These anatomical studies have been continued during the past eighteen months in the operating room on patients with heart disease who were treated by total ablation of the thyroid. In sixty patients, one hundred and sixteen parathyroid glands were identified. Approximately sixty-six per cent of the parathyroids were found just above the lower poles of the thyroid in relation to the terminal twigs of the inferior thyroid artery. Twenty-two per cent were found on the posteromedial aspect of the thyroid near the junction of the middle and upper third of either lobe. The remaining twelve per cent were scattered in atypical locations.

Because of these preliminary and subsequent studies permanent injury to the parathyroids has been uncommon. Of seventy-five patients operated on, transient mild signs and symptoms of parathyroid insufficiency were present in fourteen. These fourteen patients required either no calcium medication or medication for a period of one to four weeks. Calcium is still being administered in but two cases, the symptoms being completely controlled. No spontaneous carpopedal spasms or convulsions have occurred, and no parathormone has been required. The mild symptoms of hypoparathyroidism which appeared in these cases were presumably due to interference with the blood, lymphatic or nerve supply of the parathyroid bodies[7]. The absence of serious parathyroid insufficiency was attributable to the preservation of the parathyroids in situ. In the seventy-five operations six parathyroids were accidentally removed, but were reimplanted in the sternomastoid muscle. In the seventy-five thyroid glands submitted to the pathologist for careful search and examination, only two parathyroid glands were identified, one of which was calcified.

*Recurrent Laryngeal Nerves.* For some time special anatomical studies had been conducted with reference to the variable positions occupied by the nerve in relation to the thyroid gland. When the particular problems involved in total thyroidectomy presented themselves, further studies were undertaken. During the operative experience of the past eighteen months, similar surgical observations have been made in seventy patients. Concurrent with these surgical studies, detailed anatomical dissections were made on the recurrent laryngeal nerves in seventy cadavers. These observations are reported in detail elsewhere[5]. Briefly, the findings were as follows:

Sixty-five per cent of the nerves coursed safely in the tracheo-esophageal sulcus, in which position the nerve is best protected against serious operative injury. Twenty-five per cent coursed through the adherent zone. The latter region represents the area of fixation of the lobes of the thyroid to the trachea just below the anterolateral aspect of the bar of the cricoid cartilage at the level of the first and second tracheal rings. In this region the nerve may be concealed beneath a curtain of fibro-fascial tissue. To identify and preserve them intact, it is necessary to explore the adherent zone and the gland substance in its deep posteromedial aspect by means of careful blunt dissection. Ten per cent of the recurrent nerves partially penetrated the thyroid gland. Nerves occupying this position are obviously more subject to injury when they are being dislodged in an attempt to extirpate all thyroid tissue. During the course of seventy-five operations on patients with heart disease and in ten operations on patients without heart disease, there were twelve unilateral recurrent nerve injuries. Nine of these were transient, with complete subsequent recovery. The danger of bilateral nerve injury was obviated by the use of direct laryngoscopy[8]. In two cases direct laryngoscopy showed unilateral nerve injury without evidence of change of voice after unilateral extirpation of the thyroid and the operation was terminated. After these nerves had recovered function, the remaining thyroid tissue was successfully extirpated at a subsequent operation.

*Necessity for Total Ablation of the Thyroid.* Before the first total thyroidectomy was performed, an exhaustive search was made of the surgical and experimental surgical literature to ascertain the practicability and necessity of extirpating all thyroid tissue in order to obtain a permanent hypothyroid state. Halsted[9], in his experimental investigations on the production of hypothyroidism in dogs, found that subtotal thyroidectomy produced permanent hypothyroidism only irregularly. In the first two operations an attempt, therefore, was made to remove as much thyroid tissue as was compatible with safety to the patient[1]. Minute remnants, the size of a small pea, intimately related to the recurrents on both sides, were not removed for fear of injury to the nerves. Thus, complete

ablation was not effected. The improvement which followed operation in both instances, although definite, was temporary, paralleling the fall in the basal metabolic rate. As the metabolism rose to its preoperative level, clinical improvement was no longer manifest; the patients were again decompensated.

This experience was in accord with the failures of other investigators who attempted to treat heart disease by subtotal removal of the normal thyroid gland, leaving bits of thyroid tissue either at the tracheo-esophageal sulcus or at the upper poles of the thyroid[10, 11, 12, 13]. Although both of our operations failed to effect permanent relief of signs and symptoms of congestive failure, the coincidental improvement with the fall in the basal metabolic rate indicated that if permanent hypothyroidism could be effected, such patients would probably maintain their improvement.

It was felt, however, that further refinements in surgical technic were essential to perform the operation of total thyroidectomy. Studies were therefore carried out in the autopsy and dissecting rooms to provide these necessary improvements in technic. It was noted that in thirty-five per cent of the dissections, a pyramidal lobe was found[14]. Since this structure, composed of thyroid tissue, is capable of sustaining the metabolic level, its removal is essential. It was learned that by careful dissection of the adherent zone, all thyroid tissue could be excised from the area of tracheal fixation without injury to the recurrent nerves or to the trachea. All patients, without exception, in this series of seventy-five patients who survived operation, have developed clinical or laboratory evidence of permanent hypothyroidism.

*Choice of Anesthesia.* The choice of anesthesia in these critically ill patients was considered a difficult one from the onset. At first gas oxygen was used, occasionally supplemented by one to two ounces of ether. This appeared adequate in most cases. In a few instances, however, bronchopneumonia developed, with death in six patients. These deaths we believe were due in large part to the type of anesthesia. Avertin alone was tried in one case, with an alarming postoperative fall in blood pressure, from which the patient finally recovered. This experience discouraged further attempts in the use of this basal anesthesia. Gas oxygen was again used until Dr. Charles Mixter suggested the use of local anesthesia, which subsequently proved to be the anesthesia of choice. Local infiltration had not been tried previously because it was feared that it might interfere with the visualization of structures in the operative field, enhancing the danger of nerve injury. Its use in the last thirty consecutive cases has proved most satisfactory[15] and is partly responsible for the absence of operative mortality in these cases. It must be noted, however, that in one instance direct infiltration of the nerve resulted in a transient unilateral recurrent nerve paralysis necessitating the termination of operation after extirpation of the first lobe. This accident can be minimized by avoiding deep infiltration of the gland substance and infiltration along the tracheo-esophageal sulcus. Cervical block has not been used in this clinic, although others have had excellent results with it[16].

*Selection of Patients, and Changes in Pre- and Postoperative Treatment.* At the onset of this work patients were purposefully selected for operation who were so critically ill that not a few showed pulmonary congestion and evidences of mild congestive failure after prolonged preoperative medical treatment. Although many of these patients had an uneventful postoperative course, four of the six patients in the series who died soon after operation were in congestive failure at the time of operation. The other two had repeated attacks of congestive failure and had only recently become compensated. It is our feeling, therefore, that patients should not be subjected to operation in the presence of signs of congestive failure[17] and should be edema-free and at rest in bed for some time before operation.

At first relatively large doses of the barbituric derivatives and morphia were administered to patients before and after total thyroidectomy. It is our opinion that the use of only minimal doses of sedation pre- and postoperatively is of importance in diminishing the danger of postoperative bronchopneumonia. At present most patients receive three grains of sodium amytal the night before and on the morning of operation, and one-sixth grain of morphia before leaving for the operating floor. No attempt is made to narcotize the patient. Similarly, morphia is given very sparingly postoperatively. Under this régime, patients are awake and able to expectorate accumulated tracheal and bronchial secretions during the early postoperative period.

A medical adviser is present at each operation, observing the reaction of the patients and making necessary recommendations. Postoperatively, fluids are administered to the amount of 1500 cc. or less daily during the first three postoperative days, and are thereafter reduced to their preoperative level. All other medical adjuncts are, of course, employed before and after operation. Occasionally, prophylactic oxygen therapy is used. The other details of the medical management of these patients have been discussed elsewhere[6].

### RESULTS IN RHEUMATIC HEART DISEASE

Since the onset of these studies a deliberate effort has been made to accept for operation patients with various types of heart disease, in order that the indications for the operation

might be more clearly established. The criteria which have been used in the selection of patients and the contraindications to operation have been described. A summary of our results in angina pectoris, congestive failure and cardiac asthma due to arteriosclerotic heart disease, has been presented elsewhere[18]. In this communication the results of treating patients with rheumatic heart disease will be summarized.

Twenty-nine patients with rheumatic heart disease have been treated by total thyroidectomy. Of these, twenty-five had congestive failure, two had congestive failure and angina pectoris, one had angina induced by paroxysmal auricular fibrillation, one had congestive failure and rapid heart action. The ages ranged from eighteen to fifty-two years. The duration of illness ranged from one to eighteen years.

Of twenty-nine patients with congestive failure only five patients are less than four months postoperative. Although these patients have already shown definite improvement, the postoperative interval is too short to permit proper evaluation of the benefits they have derived from total thyroidectomy. Of the remaining twenty-four patients, twenty were operated on primarily for congestive failure. Of these twenty patients, eleven have maintained compensation for four to eighteen months in spite of indulging in activity previously impossible. The average duration of time postoperatively in these eleven patients is eight months; three were operated on more than fourteen months ago. Four of the twenty patients had recurrent failure at four, five, six and eight months after operation, but have since maintained improvement for four months since recurrent failure. One patient operated on for congestive failure died six hours postoperatively. Three died after having shown definite improvement for four, six and ten months. One patient died two months after operation without having benefited by the operation. Two patients were operated on for congestive failure and angina pectoris. One has been free of congestive failure and angina for eighteen months, in spite of working as a porter eight hours a day. One died after having shown improvement for two months after operation. One patient, operated on for congestive failure and angina pectoris induced by paroxysmal auricular fibrillation, has been free of attacks for six months. The last patient with congestive failure and rapid heart action has been free of all symptoms in spite of activity for nine months.

We have attempted to evaluate the benefits derived from total thyroidectomy in these patients with rheumatic heart disease by comparing their postoperative capacity for activity with their preoperative condition (table I). An attempt has been made to gauge the degree of activity enjoyed by the women in this series postoperatively. The term "housework" is used in table I to designate all work associated with caring for a home (including shopping) with the exception of washing clothes and floors. The term "light housework" includes cooking, serving meals, light cleaning, but no shopping.

In twenty-four patients who were followed for a sufficiently long period of time to permit evaluation, fourteen showed such definite improvement that the results were termed good; in four patients, the results were fair. One patient was unimproved and one died postoperatively. The results in four patients which do not lend themselves to the characterization of good or fair are indicated in table I.

Twelve of the fourteen patients who were considered good results had been completely bedridden; and two patients had marked limitation of activity for months to years prior to operation. Twelve of these patients are now working (one is a porter; another, a wool sorter; the others are housewives) or are able to work. Of the remaining two, one patient, who had never been edema-free for eight years and had received salyrgan for three years, has not required diuretics for eight months since operation but still is limited in her activities. The second, who had had six attacks of decompensation in five years, and had been bedridden for three years prior to operation, remained compensated for six months in spite of walking two to three miles a day. Thereafter, he failed and died twelve months after operation.

Four patients showed only fair improvement after operation; three of these suffered recurrent failure from which they have recovered. One patient, previously bedridden, who had shown sufficient improvement to permit him to walk down eight flights of stairs on a wager, died suddenly following a debauch four months postoperatively. One patient, four months after operation, although compensated, is unable to do all her housework. The patient who showed no improvement died two months after operation, at which time autopsy revealed a mitral ring so stenosed that it admitted merely the point of a scissors.

The incidence of good results was somewhat greater in the patients with rheumatic heart disease than in those with arteriosclerotic heart disease. Although it is difficult to be certain of all the factors which account for the differences in the results of two such dissimilar groups of patients, certain considerations are worthy of mention: (1) the preoperative basal metabolic rate; (2) a history of previous coronary thrombosis; (3) the age of the patient.

*Preoperative Basal Metabolic Rate.* It has been observed that after the basal metabolic rate has dropped to minus thirty per cent, small doses of thyroid extract are almost always required to prevent untoward symptoms of hypothyroidism. The total fall in basal met-

RESULTS IN TREATMENT OF CHRONIC RHEUM

| Serial Number | Age | Sex | Preoperative: First appearance of symptoms (in years) | | | | | | | Miscellaneous |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Dysp. on Exert. Years | Hemopt. Years | Attacks of Congestive Failure | Cardiac Asthma | Orthop-nea Years | Chest Pain Years | Fibril-lation | |
| 1 | 52 | M | 3 | | 1 lasting 2½ yrs. | 6 mos. | 2 | 3 | + | ? Coronary Thrombosis. |
| 9 | 42 | F | 23 | | 4 in 5 yrs. | | 10 | 10 | + | |
| 11 | 23 | M | 14 | 1 | 1 lasting 1 yr. | | 1 | 14 | 0 | |
| 12 | 45 | F | 32 | | 19 in 18 yrs. | | 5 | 10 | + | |
| 27 | 52 | F | 5 | | 2 in 2 yrs. | | | | + | Hemiplegia. Recovery. |
| 28 | 35 | F | 7½ | 7½ | 2 in 2 yrs. | | 4 | | + | |
| 35 | 47 | F | 8½ | | 3 in 8 yrs. | | 8½ | | + | Edema for 8 yrs. |
| 48 | 45 | F | 2½ | | 3 in 2½ yrs. | | 2½ | | + | ? Renal Embolism. |
| 43 | 46 | F | 9 mos. | | 2 in 9 mos. | | 9 mos. | | + | Hypertension. |
| 52 | 34 | M | 5 mos. | | 18 mos. | | | | 0 | Edema 6 mos. |
| 54 | 50 | F | 11 | 11 | 14 in 7 yrs. | | 11 | | + | Salyrgan 7 yrs. 2 weekly—2 yrs. |
| 53 | 30 | F | 11 | 11 | 2 in 2 yrs. | 2 mos. | | | + | Edema 2 yrs. |
| 3 | 27 | M | 7 | 7 | 6 in 5 yrs. | | 4 | 3 | 0 | |
| 23 | 27 | F | 10 | 3 | Mild failure for 2 yrs. | | | 2 | + | |
| 56 | 50 | F | 13 | | 2 in 14 mos. | | 1½ | | | Aortic insuf. Hypertension 190/90. |
| 24 | 48 | F | 5 | | 8 in 3½ yrs. | 5 | 3½ | | + | 6 hospital admissions —3 yrs. |
| 30 | 18 | M | 3 | | 3 in 2 yrs. | | | | + | Hemiplegia with recovery. |
| 31 | 22 | M | 7 | | 6 in 5 yrs. | | 5 | 5 | + | |
| 34 | 38 | F | 10 | | 10 yrs. | | 10 | | + | Salyrg. 5½ yrs. 2 weekly—2 yrs. |
| 6 | 22 | M | 12 | 4 | 8 in 12 yrs. | | 12 | 4 | + | Pulmonary edema. |
| 29 | 28 | M | 1 | 6 mos. | 1 yr. | 3 in 1 yr. | 1 | | 0 | Aortic regurg. |
| 60 | 41 | M | 14 | | Limitation of activity due to dyspnea. | 6 mos. | | 3 | | Aortic stenosis and regurg. Angina 3 yrs. |
| 44 | 39 | F | 18 mos. | | | | | 10 yrs. | 1—3 attacks weekly | Paroxysmal auricular fibrillation and angina. 12 yrs. |
| 32 | 21 | M | 2 | | 2 in 2 yrs. | | 2 | 2 | | B. P. 300/0 Rapid heart action. Palpitation. |

All patients had mitral stenosis and insufficiency.
All patients developed permanent hypothyroidism a
* This man was totally incapacitated with symptoms after operation he was free of signs and symp
† Entirely free from symptoms and returned to work
†† Definite improvement for four months. Could walk
††† No angina; congestive failure before sudden death

## TABLE I

EATMENT OF CHRONIC RHEUMATIC HEART DISEASE BY TOTAL THYROIDECTOMY

| Fibrillation | Miscellaneous | Activity preoperative | Time Since Op. (Mos.) | Activity |
|---|---|---|---|---|
| + | ? Coronary Thrombosis. | Bed and chair 2 yrs. | 18 | Porter—8 hr |
| + | | Bedridden 6 mos. | 14 | Housework. |
| 0 | | Bed and chair 1 yr. | 14 | Wool sorter. |
| + | | Out of bed 2—4 hrs. daily in last 5 yrs. | 14 | Light housew |
| + | Hemiplegia. Recovery. | Bed and chair 2 yrs. | 10 | Housework. |
| + | | Light housework. | 9 | Housework. |
| + | Edema for 8 yrs. | Bed and chair 3 yrs. | 8 | Light housew |
| + | ? Renal Embolism. | Bedridden 6 mos. | 6 | Light housew |
| + | Hypertension. | Mostly in bed since onset | 6 | Housework. |
| 0 | Edema 6 mos. | Moderately active. | 4½ | Walks 2—3 Unemploye |
| + | Salyrgan 7 yrs. 2 weekly—2 yrs. | Bed and chair, very little housework—2 yrs. | 4 | Light housew |
| + | Edema 2 yrs. | Little or no activity, 11 yrs. Bed and chair 1 yr. | 4 | Light housew |
| 0 | | Bedridden 3 yrs. | 12 | Walked 2—3 |
| + | | Moderately active in spite of dyspnea. | 4 | Clerk—8 hrs. |
| | Aortic insuf. Hypertension 190/90. | Bed and chair 2 yrs. | 4 | Light housew |
| + | 6 hospital admissions —3 yrs. | Mostly in bed 2 yrs. | 10 mos. | 8 children. A work—5 m |
| + | Hemiplegia with recovery. | Bed and chair 6 mos. | 9 mos. | Walks 2—3 Decomp. 5 |
| + | | Bedridden for 6 mos. | 9 mos. | Walks 1—2 n |
| + | Salyrg. 5½ yrs. 2 weekly—2 yrs. | Bed and chair 2 yrs. | Died 6 hrs. postop. | |
| + | Pulmonary edema. | Bed and chair 4 yrs. | 6 mos. | Walked 2—3 |
| 0 | Aortic regurg. | Bed and chair 8 mos. | 2 mos. | Bed and cha |
| | Aortic stenosis and regurg. Angina 3 yrs. | Bed and chair 4 yrs. | 2 mos. | Bed and chai |
| 1—3 attacks weekly | Paroxysmal auricular fibrillation and angina. 12 yrs. | 1—3 attacks weekly. | 6 mos. | Housework. |
| | B. P. 300/0 Rapid heart action. Palpitation. | Bedridden 1 yr. | 9 mos. | Up and abou |

ts had mitral stenosis and insufficiency.
its developed permanent hypothyroidism after operation.
was totally incapacitated with symptoms of advanced congestive failure for three years. For six months
operation he was free of signs and symptoms and led a normal moderately active life.
ree from symptoms and returned to work for four months. Sudden death probably due to embolus.
nprovement for four months. Could walk one or two miles. Death after alcoholic and other excesses.
; congestive failure before sudden death two months postoperatively.

| Postoperative | | |
|---|---|---|
| Activity Post-op. | Signs and symptoms Congestive Failure | Results |
| rter—8 hrs. daily. | Absent. | Good. |
| usework. | Absent. | Good. |
| ol sorter. | Absent. | Good. |
| ht housework. | Mild dyspnea. Occ. min. edema at end of day for past 2 mos. | Good. |
| usework. | Absent. | Good. |
| usework. | Absent. | Good. |
| ht housework. | Mild dyspnea. Onset of edema of ankles 6 mos. postop. Disappearance with rest. | Good. |
| ht housework. | Absent. | Good. |
| usework. | Absent. | Good. |
| lks 2—3 miles a day. Unemployed. | Absent. | Good. |
| ht housework. | Absent. | Good. |
| ht housework. | Absent. | Good. |
| lked 2—3 miles a day. | Absent for 6 mos. Recurrent failure 11 mos. postop. | * |
| rk—8 hrs. daily. | Absent 4 mos. Cerebral embolus. Death. | † |
| ht housework. | Absent. | Fair. |
| hildren. All house ork—5 mos. | Absent 6 mos. Decompensation at 6 and 10 mos. | Fair. |
| lks 2—3 miles a day. Decomp. 5 mos. | Absent 5 mos. Mild break. Comp. 4 mos. thereafter. | Fair. |
| ks 1—2 miles a day. | Absent 4 mos. Discontinued digitalis. Decomp. at 4 mos. Recovery. Comp. 5 mos. thereafter. | Fair. |
| lked 2—3 miles a day. | Much improved 4 mos. Sudden death. | †† |
| and chair. | No improvement. Died 1 mo. postop. | Unimproved. |
| and chair. | Sudden death 2 mo. postop. | ††† |
| usework. | Absent. | Good. |
| and about all day. | Absent. | Good. |

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abolism following operation therefore depends largely on the preoperative basal metabolic rate. If the degree of improvement is generally proportional to the total fall in basal metabolism, it would be expected that patients with low preoperative levels would benefit less than those with higher basal levels. This postulation has been borne out by our experience. Twelve patients in the group with arteriosclerotic heart disease had preoperative basal metabolic levels ranging between minus ten and minus twenty-four per cent, whereas only five with rheumatic heart disease had preoperative basal metabolic rates between minus ten and minus fourteen per cent (the lowest rate in this group). It is significant that of the six patients in the arteriosclerotic group who showed little or no improvement, the preoperative basal metabolic rates in four were minus fourteen, minus nineteen, minus twenty-three, and minus twenty-four per cent respectively.

*Coronary Thrombosis.* The course of patients with coronary artery disease, particularly those who have had a past coronary thrombosis, is notoriously variable. Regardless of the decrease in cardiac work induced by hypothyroidism, it has been our experience that the results of operation in these patients are unpredictable. Fourteen patients with arteriosclerotic heart disease gave a history of a past coronary thrombosis. Of these patients four showed little or no improvement. The result in these patients was also complicated by the presence of low preoperative basal metabolic rates. On the other hand, two patients with previous coronary thromboses have been able to return to work. Coronary thrombosis, however, is rare in rheumatic heart disease and so this factor will seldom require consideration in such patients.

*Age.* The group with arteriosclerotic heart disease was definitely older; twenty-six of thirty-six of these patients ranged in age between fifty-five and seventy years. These patients are more subject to cerebral thrombosis or hemorrhage and coronary thrombosis. The group with rheumatic heart disease was definitely younger; fourteen of twenty-nine of these patients ranged in age between thirty-five and fifty-two years. These patients are, of course, subject to embolic phenomena and recurrence of active rheumatic fever. It is difficult to attempt to prognosticate the future course of these two groups of patients. How long they will maintain their improvement will depend on the rate of progression of the underlying disease and the occurrence of vascular accidents peculiar to each group.

## SUMMARY AND CONCLUSIONS

1. Anatomical and surgical studies of the parathyroid bodies and recurrent laryngeal nerves are reported in summary.

2. In seventy-five operations there have been three permanent unilateral nerve injuries.

3. No severe manifestations of parathyroid insufficiency occurred. Two patients still require calcium therapy; their symptoms are completely controlled.

4. By modification in pre- and postoperative treatment, improvements in surgical technic, and by the use of local anesthesia, the last thirty-six consecutive patients with chronic heart disease have been operated on without mortality.

5. The results of total thyroidectomy for the treatment of chronic rheumatic heart disease are reported and compared with those obtained in the treatment of arteriosclerotic heart disease.

6. The beneficial results that have been achieved by total ablation of the normal thyroid gland in patients with angina pectoris and recurrent congestive failure warrant the further application of this procedure in patients who are incapacitated in spite of all available medical treatment.

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## DISCUSSION

CHAIRMAN DALAND: Dr. Blumgart will later discuss the paper.

The discussion will be opened by Dr. Howard M. Clute of the Lahey Clinic, Boston.

DR. CLUTE: Studies which Dr. Blumgart has presented to-day to this Society are the results of much painstaking scientific investigation and clinical work which has been applied to the treatment of patients with hopeless and completely incapacitating heart disease. None of us who have heard Dr. Blumgart can fail to appreciate the thoroughness with which he has carried out these investigations, nor the care with which he and his associates have reported their results.

We have been somewhat slow in the Lahey Clinic to accept the operation of total thyroidectomy for the purpose of designedly producing myxedema, and so lessening the work on seriously damaged hearts. It has been our feeling that Dr. Blumgart and his associates were carrying out a most excellent study of this problem, and that sufficient time should be allowed to elapse to learn their late results before the method was generally adopted. We have, however, in the past few months done twelve operations of total thyroidectomy in patients with congestive heart failure, and in patients with angina, and so we are prepared to state at least our preliminary impression of this new therapeutic measure.

It is very necessary in considering this method of therapy that we all should realize that the selection of the proper patients for this operation demands the foremost consideration. In our experience with many thyroid operations, we have come to appreciate first, that myxedema following thyroidectomy is not in itself a desirable disease. We cannot in any patient with heart disease lightly decide for a total thyroidectomy with the production of myxedema. Certainly as the previous speaker has emphasized, in dealing with these patients this operation should only be considered as a method of last resort, and not as a method of first choice.

Furthermore, from our experience with thyroid surgery, we realize that total thyroidectomy particularly in such serious risks as these patients with heart failure, must be approached as an operation which will doubtless always carry a definite mortality. We know that thyroidectomy may well be accompanied by serious complications even when it is performed on patients who have large goitres, and in whom a total ablation of the gland with its added technical difficulties is not to be performed. We know the serious results of tetany and especially of chronic tetany, following thyroidectomy, and that tetany is more likely to happen following total thyroidectomy than following subtotal thyroidectomy. We know the serious dangers of the complications following injury to one or particularly to both recurrent laryngeal nerves. We know the mortality that may follow hemorrhage after thyroidectomy, and that may follow infection in the mediastinum.

We are satisfied that only by long training and experience can these complications be avoided in the surgery of the thyroid when a goiter is present; and we are satisfied that these complications will be of not infrequent occurrence, and may well have even more serious consequences if they follow total thyroidectomy on the normal thyroid gland in patients with serious heart disease.

Technical considerations of the operation of total thyroidectomy are not important for us to discuss in a general meeting of this sort; how one recognizes the parathyroids and where they lie; how one locates and avoids the recurrent laryngeal nerves; how one finds the pyramidal lobe, whether it be single or double, and makes certain that every vestige of thyroid tissue is removed so that thyroid function will not be reëstablished by some remnants of gland tissue which are left behind, are details which should be discussed in the surgical amphitheatre.

The medical man should expect particularly in these patients with serious heart disease a surgical procedure which assures a relatively rapid operation and a safe recovery for the patient with an avoidance of tetany; with no laryngeal palsy which necessitates tracheotomy and with the assurance that all thyroid tissue will be removed and myxedema so produced.

The surgeon in his turn must have the most painstaking study and careful selection of cases for this operation by the medical man, and he must be assured that every other conservative means for the alleviation of the symptoms of heart disease has been totally and completely exhausted before the patient is considered as a candidate for total thyroidectomy.

It is our feeling that there is no doubt a definite place for the operation of total thyroidectomy in serious types of heart failure, but I believe that as yet the application of this procedure should be decidedly limited. I believe that we should be extremely slow to apply this procedure generally to patients with heart disease until more time has elapsed for Dr. Blumgart, Dr. Berlin, and other early investigators to note the late results in their cases. Immediate results as reported by Blumgart and Berlin, and as we have seen in our cases have been in many instances most satisfactory. Yet, one cannot but recall before this operation was advocated, that the medical men repeatedly stated that there was nothing they hated to see more than the patient with angina pectoris and myxedema. If they relieved the myxedema with thyroid extract, the angina returned, and if they did not relieve the angina with thyroid extract, the myxedema made the patient miserable. This factor must be kept in mind in deciding to consciously produce myxedema in these patients.

Finally, it seems to me that we must all recall that this operation only lessens the load on a seriously damaged heart, and that it by no means replaces the damaged heart with a good heart. We must not fail to recall that after total thyroidectomy these patients will have not only a seriously damaged heart but a new disease,—myxedema.

CHAIRMAN DALAND: The discussion will be continued by Dr. Robert C. Cochrane, of the Boston City Hospital.

DR. COCHRANE: I do not believe you gentlemen know quite how much work has been done by this group. They have done a splendid piece of research work, and they deserve all the credit in the world for it. However, I think Dr. Clute has covered

many of the points that I wanted to bring out. Dr. Blumgart also brought this out: in the first place, the selection of cases. We have had only a small series of cases in the Boston City Hospital because we did not start to do them until the beginning of this year. The first case operated on was one that never should have been done, and we would not do a similar case again. He was a young boy, fourteen years old, who was wholly decompensated; we operated on him in our enthusiasm, and next day the cardia failed.

I think this is a valuable procedure, and in many of our cases of congestive failure we have evidence of remarkable results. On the other hand, at times there has been no, or very little, improvement. With patients who have had complete congestive failures but who can be relieved of edema by medical treatment an operation is justifiable. Some patients following this operation can lie flat in bed, their capacity for work is increased, and they have been made really useful citizens. One of the last cases we did in the City Hospital had his vital capacity increased from about 1800 cc. to 3600 cc., and the patient clearly is going to be able to support himself and lead a useful life.

These patients, however, are always strictly medical problems. The surgeon is only an incident in the picture. He takes out a gland but there are always medical problems, and I wonder how much of the improvement possible is due in these cases to the fact that following their total thyroidectomy they were followed medically a great deal more strictly than was previously done. Also, Dr. Weiss recently called attention to the case of a young girl who was very badly decompensated. It took several months to get rid of the edema, and finally this was accomplished and the patient has been practically symptom-free for four or five years. It is probable that some of these patients even without this operation might show considerable improvement. We do not know definitely because this procedure has not been carried out long enough to demonstrate exactly what benefit is going to result.

The point that Dr. Blumgart brought out about patients with lowered metabolism not being satisfactory patients is also important.

We have not had much experience with total thyroidectomy in cases of angina at the City Hospital, because we do not see that type of patient very often. Most of our cases have been the congestive failures. For two of our anginas, unfortunately, we selected the wrong patients. One patient did very well for thirty-six hours. We relieved severe pain. Previous to the operation he had been having twenty to twenty-five attacks daily but at the end of thirty-six hours he developed coronary thrombosis and died very promptly. Of course, that is always going to be the risk with these anginas. The other one of those two unfortunately had bronchiectasis previous to admission, which we did not find out about. This patient died four days after the operation, from pneumonia.

I think the mortality may well run up as high as thirty per cent; but as time goes on and these cases are better selected, the mortality is going to drop. That was brought out. The mortality was higher when they first began this procedure than it is at present. Of course the cases are going to be more carefully selected.

I feel, as Dr. Clute does, that we have not yet been able to estimate the true value of this procedure. I think it should be reserved for those cases that have repeated congestive failures but which can be relieved of their edema under medical treatment, rest in bed, and possibly the anginas. But I do think that this is a valuable procedure which should be carried on until we can come to a more proper estimate of its value.

CHAIRMAN DALAND: The paper is now open for general discussion.

DR. H. A. CHRISTIAN, Boston: I regret very much that no one from the Peter Bent Brigham Hospital has been asked to discuss this paper, because we have a very large amount of material accumulated in a study of these cases. Unfortunately, I cannot give you the detail of that experience, but it is essentially the same as that reported by Dr. Berlin and Dr. Blumgart.

As an internist, it seems to me there is absolutely no doubt but that this procedure has introduced into the care of the cardiac patient a very, you might say an extremely, valuable therapeutic method. It has a definite place, it has a definite limitation, but it has already accomplished things in patients with whom other methods have failed—things that are not to be accomplished by any other procedure thus far devised.

To a group of surgeons it should be emphasized that the after-care of these patients is one of the most difficult therapeutic problems we have. That lesson we long ago learned in the care of the myxedema patients. The difficulty of caring for the myxedema patient with cardiac disturbances was so great in my own experience and observation of these cases, an experience which I reported nine years ago before the Rhode Island Medical Society, that it led me, seven years ago, to write this sentence in a book* which has since been published: I quote that sentence:

> "Were there not discomforts associated with myxedema, an induced myxedema might be considered an ideal measure for the treatment of angina pectoris, for the myxedematous patient actually, by reason of the myxedema, deports himself much as we advise for the patient with angina pectoris."

That statement is now seven years old.

Now, what are some of these things that the myxedematous patient has that make him uncomfortable? Dry skin, great susceptibility to colds, slow mental reaction but not mental deterioration, edema including ascites and hydrothorax, cardiac insufficiency, arteriosclerosis, including arteriosclerosis of the coronaries, productive of angina pectoris, and anemia. They result from myxedema without any necessary accompanying cardiac disturbance other than that from myxedema. These are the conditions that the myxedematous patient has when he naturally acquires the disease. These are the things he is going to have when it is artificially produced, provided great skill and great care are not exercised in the future treatment of these patients.

Moreover, with all our available care, these various discomforts do occur, and they occur not in all patients but in some patients, and when they do occur we meet an impasse because we cannot control the difficulties of the myxedema without reproducing the disabilities of cardiac insufficiency.

This word of warning about the after-care is timely, because it has already come to our attention that in a number of clinics patients have had the thyroid totally removed, and they have been discharged without any particular supervision and have experienced great difficulties.

CHAIRMAN DALAND: Is there any further discussion? If not, Dr. Berlin.

*The Diagnosis and Treatment of Diseases of the Heart. Oxford Monographs on Diagnosis and Treatment. New York: Oxford University Press. Vol. III, 1928.

DR. BERLIN: The indiscriminate and improper application of this therapeutic measure must be carefully avoided. I should like, therefore, to emphasize the absolute need of the closest coöperation of the surgeon and the medical man in the selection and preparation of patients for operation. No patient suffering from chronic intractable heart disease should be submitted to this operative procedure without the collaboration and approval of a competent internist.

CHAIRMAN DALAND: Dr. Blumgart.

DR. BLUMGART: I am in complete accord with Dr. Clute's opinion that this operation should be undertaken only after all other available therapeutic procedures have failed. It is most important, on the other hand, that patients should not be operated on in the terminal stages when they may be practically moribund with congestive heart failure or are practically in status anginosus. The operative mortality rate in such cases as well as the incidence of subsequent deaths will be inevitably high, and patients who are so critically ill probably will not be restored to useful activity. Some operations have been performed on patients so gravely ill that they have died several weeks postoperatively, before the beneficial effects of complete thyroidectomy could be manifest. The most marked therapeutic improvement occurs when the hypothyroid state develops. The best index of the hypothyroid state is the basal metabolic rate. The lowering in the metabolic rate frequently is not marked until the end of the first month. If the patient is so ill that he cannot withstand the operation and survive three to four weeks, he is simply subjected to the pain, discomfort and hazards of the operation without obtaining its beneficial results. In brief, while I believe the operation should be performed only after all available therapeutic measures have been invoked, the operation should not be undertaken in the terminal stages of cardiovascular disease, particularly in those patients who in spite of prolonged rest in bed still show evidences of congestive failure.

Throughout our studies we have evaluated not only the therapeutic results of the operation but also the possible untoward effects of the myxedematous state. The available time is too short to permit a summary of our findings but they will be presented in other publications. The condition which we produce is entirely within our control. In patients who have had their thyroid glands removed because of carcinoma, and in patients with spontaneous myxedema, all the known functions of the thyroid have been restored to the patient over periods of time as long as twenty to thirty years by giving thyroid by mouth. The untoward symptoms of myxedema, such as weakness of the legs, mental slowing, marked sensitivity to cold, occur after total thyroidectomy just as they do in spontaneous myxedema. The discomfort of myxedema almost always appears at metabolic rates below minus thirty per cent. This is in accord with Dr. Means' observations in patients with spontaneous myxedema. By giving small doses of thyroid by mouth, in most cases ¼ grain daily, the basal metabolic rate can be maintained between minus twenty-five and minus thirty per cent. At this level, the patient usually does not experience the untoward effects of myxedema and at the same time the heart is released from the burden under which it has had to labor.

In regard to Dr. Cochrane's citation of a young girl who showed spontaneous clinical improvement somewhat unexpectedly, we must remember that this occurs particularly in patients with active rheumatic infection. We have been especially careful not to confuse the beneficial effects of thyroidectomy with the improvement that may occur with the subsidence of rheumatic infection. In our seventy-five patients, only one was operated upon in the presence of any evidence of active rheumatic infection.

Dr. Christian has mentioned the occurrence of hydrothorax and ascites in myxedema. This is quite unusual. We have not witnessed such phenomena in any of our patients although several have suffered from temporary recurrent failure. Dr. Christian's remarks in regard to the predisposing influence of myxedema to arteriosclerosis are very interesting. In the relatively short time that has intervened since operation, our patients have not shown any observable increase in the calcification of their blood vessels according to clinical examination or x-ray studies. However, even if our patients die later of arteriosclerosis and its complications, after intervening months or years of comfort, and, in many cases, after restoration to economic independence, the results will justify this method of treating patients with intractable heart disease.

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CHAIRMAN DALAND: The Chair has appointed the following Nominating Committee: Dr. John M. Fallon of Worcester, Dr. Frederick S. Hopkins of Springfield, and Dr. Marshall Alling of Lowell. Is the Committee ready to report its nominations of officers for the ensuing year?

DR. FALLON: *Mr. Chairman*—Your Committee has met and nominates for Chairman Dr. Ralph W. French of Fall River, and for Secretary Dr. E. Parker Hayden of Boston.

CHAIRMAN DALAND: I have been asked to call your attention to the fact that the College of Surgeons is meeting in Boston during the week beginning October 15, and particularly to the meeting to be held on Wednesday of that week, a Public Health meeting in the Boston Arena. This is a lay meeting and will in no way conflict with the evening meeting of the Congress. It is a meeting conducted by the College of Surgeons, with a group of twelve-minute speakers dealing with public health, personal health, hospitalization, and so on. These meetings have been held for several years in other cities, and the Chicago authorities feel that they will easily fill the Arena, which has 10,000 seats. The last meeting filled two auditoria, each of which held 10,000.

The reason I am speaking of it now is so that you will know that this is going on, and also that you will know of the publicity which will be carried out in your communities, in the high schools, in the churches, in the hospitals, and so on. The whole motto or key words of these meetings is "See your Family Physician." The purpose is to present health matters vital to the lay audience, and the speakers will be made up of officials of the College and doctors from various parts of the country.

Is there any other business to come before this Section at this present session? If not, we will proceed with the third paper.

Dr. Hermon Carey Bumpus, Jr., comes to us, recently from the Mayo Clinic, where for a number of years he has been a member of the staff. More recently he has been in charge of the work on transurethral resection, and he is about to remove to Pasadena, California. His subject to-day is "Transurethral Prostatic Resection." Dr. Bumpus.

DR. BUMPUS: *Mr. Chairman and Members of the Society*—It is always gratifying to be invited to address a medical meeting in one's native State, and I want you to know I greatly appreciate being here at this time.

# TRANSURETHRAL PROSTATIC RESECTION*

BY HERMON C. BUMPUS, JR., M.D.†

SINCE ancient times, various instruments have been devised, and innumerable attempts have been made, with indifferent success, to crush stones in the bladder. Although the principle is sound, it was not until Bigelow, at the Massachusetts General Hospital, perfected his lithotrite and evacuator that litholapaxy was accepted as a standard procedure.

Transurethral resection to-day stands in much the same place as that in which lithotrity stood in Bigelow's time. The principle of transurethral resection is sound, and is based on the same reasoning as is litholapaxy, namely, that it is unnecessary and often dangerous to perform a major operation in order to remove in its entirety an obstruction to the urinary stream that can be removed equally well in small segments, at much less risk to the patient.

Although litholapaxy has been a standard operation for fifty years, and even has been considered by some urologists as a procedure to carry out in the office, yet to-day the operation of suprapubic cystostomy, for removal of stone in the bladder, is far more frequently employed than is litholapaxy. This is so in spite of the fact that the mortality rate of litholapaxy is, according to Crenshaw, 1.3 per cent in a series of 153 cases in which it was performed, whereas the average mortality rate of cystostomy is around four per cent.

Fifty years from now I dare say it will be equally well appreciated that transurethral resection is a safer procedure than is prostatectomy, that the duration of hospitalization for transurethral resection is short in comparison with that for prostatectomy. However, prostatectomy may still be more frequently practiced, for the same reason that suprapubic cystostomy for stone is used more frequently than is litholapaxy. An instrumental procedure such as transurethral resection requires skill and special training, whereas suprapubic prostatectomy requires but little skill and special training.

The patient on whom litholapaxy or transurethral resection is performed usually can return to his occupation in from a few days to a week or two. He has, as a souvenir of his adventure, a few fragments of stones or a few small chips of tissue. In contrast is the patient from whom a stone or prostate gland has been removed suprapubically. He has had the experience of weeks in the hospital, with a suprapubic drainage tube in place for part of the time. He can show the removed stone or prostate gland and when "speaking of operations" can exhibit the scar and not infrequently a good-sized postoperative hernia. He is much more likely, of course, to consider the surgeon's skill favorably than is the patient who has none of these physical signs of his encounter with a member of the medical profession to exhibit, and has simply resumed normal urinary function after a short period of partial incapacity. I stated that fifty years might find resection in the same position as that occupied by litholapaxy to-day, but this seems doubtful, for if surgeons tend to be too conservative, erring on the side of what they consider to be safety, the public does not. Stones in the bladder are comparatively rare, and the value of litholapaxy as a curative procedure is not generally appreciated by laymen. Prostatic hypertrophy is common, and many of those who are afflicted are at the age of retirement and have little to do on returning home but to discuss their experience. When these experiences have consisted of only a few days in the hospital, and when the functional result is the equal of, and often is superior to that of a neighbor who has put in six long weeks undergoing prostatectomy in two stages, it is going to be increasingly evident to the patients, who are little concerned with dogma, and much with what they think of as horse sense, that a procedure that requires weeks of hospitalization and carries a high mortality rate is not so good as one that carries a mortality rate of approximately one per cent and usually entails hospitalization of less than a week.

Lest I seem unduly to favor resection, let me quote the figures compiled for last year by Thompson of The Mayo Clinic. Transurethral resection was performed in 451 cases. There were five deaths, a mortality rate of 1.1 per cent. In the course of the year prostatectomy was performed in only seven cases, with one death; 98.5 per cent of all patients who had prostatic hypertrophy which required surgical treatment, were accorded transurethral resection. In the same institution, the mortality rate in a series of more than 2,000 cases in which suprapubic prostatectomy was performed, before transurethral resection came into favor, was in excess of six per cent. Caulk, in St. Louis, has found transurethral resection applicable in eighty-five per cent of his cases, and Alcock, in Iowa City, employs transurethral resection in all cases in which the instrument can be passed; he has reported only two deaths in his last 275 cases.

In the course of 1932 and 1933, resection was performed in 721 cases at The Mayo Clinic. Of the patients concerned, 357, or 49.5 per cent, were confined to the hospital seven days or less, and 81.27 per cent were there less than two

*Read before the Section of Surgery of the Massachusetts Medical Society, Worcester, June 5, 1934.

†Bumpus, Hermon C., Jr.—Associate Professor, Mayo Foundation, University of Minnesota Medical School. For record and address of author see "This Week's Issue," page 895.

weeks. Alcock found that in the last 400 cases in which he had performed prostatectomy, the average stay in hospital was seventy-one days, whereas in an equal number of cases in which he performed resection, the average stay in hospital was only nine days. If one considers the average cost of a day in hospital to be $5.00, this saving of sixty-two days alone leaves the patient in a much better financial condition, and the hospital is able to care for many more patients in the same number of beds. The saving in gauze and dressings also has been no small item, as observers of the change from prostatectomy to transurethral resection can testify.

The permanency of the cure following transurethral resection has been questioned, when compared with that following prostatectomy[1, 2]. All urologists know that, following suprapubic drainage, an obstructing prostate gland shrinks, because of lessening of the edema, congestion and engorgement that were caused by the obstruction. The same process occurs following transurethral resection if the patient is relieved of all residual urine. During 1933, at The Mayo Clinic, of the 451 patients, who were subjected to transurethral resection, nineteen or 4.2 per cent had undergone previous transurethral resection at the clinic. Of these, eight had a malignant gland at the time of resection. If these eight are excluded the recurrence is 2.7 per cent which is less than the possibility of death following suprapubic prostatectomy. When the relative inconvenience of subsequent transurethral resection is compared with the risk of death that accompanies complete enucleation, there seems little to choose. In the course of 1933, also at The Mayo Clinic, ten of the patients who were treated by transurethral resection had been subjected to primary prostatectomy, three of them at the clinic and seven elsewhere. Thus, it is seen that even prostatectomy cannot be considered free of the possibility of being followed by recurrence.

Some hold that the procedure should be confined to cases in which obstruction is not great and to those in which the patients are in such poor physical condition that prostatectomy is contraindicated. For patients of the latter type, transurethral resection is indeed a blessing, for it makes possible relief of urinary obstruction, and it allows of normal function, whereas before, such patients were condemned to pass urine by catheter for life, or were obliged permanently to wear a suprapubic tube.

Alcock found that the average age of his patients who underwent prostatectomy was sixty-six years, whereas the average age of the last 200 patients on whom he performed transurethral resection was more than seventy-three years. He wrote: "At least 20 per cent of the resection cases were such bad risks that I never would have attempted a prostatectomy."

Last year, Thompson, who at that time was my associate at The Mayo Clinic, invited all patients who had hypertrophic prostate glands, but who had been sent home because their general physical condition would not permit of prostatectomy, to return, and they are included among the 451 patients who were subjected to resection last year. Of the 451 patients, it was necessary to perform suprapubic cystostomy on thirty-six before transurethral resection; this was because of the patient's poor condition.

If resection carries so much less risk for the generally debilitated patient, it should be evident that it is equally less dangerous for the patient who constitutes a good surgical risk. It is, but, compared to prostatectomy, transurethral resection is much harder on the surgeon, for it requires more skill, is time-consuming, tedious, and far from spectacular. In contrast, suprapubic enucleation is rapid, spectacular and easily performed. In other words, prostatectomy is a dangerous operation for the patient but easy for the surgeon, whereas transurethral resection is difficult for the surgeon but comparatively safe for the patient. Patients are appreciating this fact.

Those urologists who advocate limiting the use of transurethral resection to cases in which the prostate gland is small, or in which obstruction is the result of a median bar assume that in such cases the operation is relatively easy of performance, and is relatively more likely to be followed by good functional results. This has not been my experience, and for those who contemplate adopting this newer method of treatment, I would advise against commencing with this type of case. In the first place, many of these patients are suffering primarily from prostatitis and its associated symptoms rather than from obstruction. True, the relief of what obstruction exists may benefit the prostatitis but the disappointing results of resection will be found to occur mainly in cases of this group, in which the symptoms are from the infection rather than from the obstruction. Moreover, there is less prostatic tissue surrounding the urethra in these cases and the distance from the verumontanum to the vesical sphincter is short. All of these factors demand experience in order to know just how much tissue to remove. In a case of moderate benign hypertrophy, the surgeon has considerably more margin of safety, and an especially deep incision, here or there, is not so likely to exceed safety, and possibly to result in urethral penetration and ensuing extravasation of urine.

### ANSWERS TO CURRENT CRITICISMS

Examination of some of the current criticism of the procedure may explain why it has not met a more favorable reception. I am told that the manufacturer of an incontinence clamp formerly sold about a dozen a year. During 1933, with the more general adoption of transurethral

resection, more than 400 were sold. Various devices for removal of clots from the bladder and especially constructed hydrostatic bags for control of hemorrhage also have been exploited since the advent of transurethral resection. The interest in urinary antiseptics was never so marked, and the incidence of stricture following transurethral resection is also said to be considerable. All of these are indications that the procedure is not without grave dangers, distressing complications, and possible death. Let us, then, consider these untoward results singly and seek their explanation.

*Incontinence.*—In cases of incontinence it is known that the internal sphincter may be disregarded, for it is functionally destroyed by greatly hypertrophied prostate glands and is usually cut through in the course of transurethral resection of smaller glands. In fact, Boyd has expressed the belief that its sectioning and resulting complete relaxation explain some of the excellent results obtained by transurethral resection. Continence depends on the external sphincter, which is situated just distal to the verumontanum. The most popular instrument for transurethral resection at the present time is the McCarthy resectoscope, with which the obstructing tissue is excised by means of an electrified wire loop pulled toward the surgeon. It is very easy to pull this loop just a short distance too far, for the inclination of the surgeon is to bring the entire instrument toward him as he cuts. Because the high frequency current destroys tissue for some distance beyond the point of contact with the wire loop, a single, unintended cut beyond the verumontanum may completely destroy the external sphincter. Such an unfortunate occurrence should not be considered as a condemnation of the procedure or instrument, but simply as an indication of the surgeon's lack of skill. Those who employ the less popular punch type of instrument are not subject to this risk, for the fenestra of the instrument engages the edge of the bladder before it can be brought out far enough to injure the external sphincter. No cases of incontinence have been encountered either by Caulk or by me. Both of us use an instrument in which the principle of the punch is employed, although we use different instruments.

*Bleeding.*—This has been the complication most dreaded, and failure to control bleeding has done most to prevent general adoption of transurethral resection. For those who use a lens system of vision, and who cut with a wire loop and high frequency current, bleeding must always be under absolute control or else vision will be faulty. To control the bleeding, the vessels are sealed by electrocoagulation; the current is of the same type as that used for excision of the tissue, but of different intensity. All tissue that is subjected to electrocoagulation, and killed, must be absorbed or slough away. If it sloughs away, vessels that were previously sealed may open and bleed. Such bleeding usually occurs in the second week of convalescence. If spinal anesthesia is used, there may occur sufficient fall in blood pressure to render the site of operation almost bloodless during the operation, but with the return of pressure to normal some hours after the operation, bleeding may occur.

Bleeding from either of the foregoing causes is seldom sufficient to be alarming were it not for the clots that result. These obstruct the urethra, cause the bladder to become overdistended, and cause spasms of the bladder in its effort to empty itself. Spasms stretch the site of operation and make the bleeding still more profuse. To adopt a policy of watchful waiting, in the hope that the bleeding will cease, is fatal. It is bound to continue as long as clots are present in the bladder. These are not difficult to evacuate and should be removed immediately. Hemostatic bags are of little avail, for they tend to increase rather than to diminish the tendency to spasm. Catheters are dangerous, for there is a tendency on the part of the surgeon to keep forcing in fluid, with the forlorn hope that the next syringeful will return with the clot. I have known bladders to be ruptured by this method. The simplest means is to pass a direct cystoscope of large caliber, find the clots and, placing the end of the instrument over a clot, apply suction with a large syringe. In this way large masses of clotted blood can be removed rapidly. Some surgeons employ the Bigelow evacuator, but the rubber bulb does not give the amount of suction that can be obtained with a syringe. Once the clots are evacuated, and the bladder is kept empty with an indwelling catheter, the bleeding usually ceases. If it persists, the resectoscope must be passed, the bleeding point found, and coagulation applied, such as is applied in the course of an operation.

Although I have stressed this complication of bleeding, it has occurred in my experience in only five per cent of cases, and in only three per cent was the bleeding sufficient to compel evacuation of clots as described. It has never been a factor in the mortality rate, nor has suprapubic cystostomy been required in the last 500 cases. However, if bleeding is neglected, and if the bladder is allowed to become distended, it easily can, and undoubtedly has, proved fatal. For those who are inexperienced in the use of transurethral instruments, immediate cystostomy offers the safest means of control of bleeding.

Because a high frequency current is employed with the wire loop electrode, to excise the tissue, as well as to seal the bleeding points by

coagulation, there passes through the remaining tissue a greater amount of current than is required when the tissue is cut away and the current used only to coagulate the bleeding points. This limited use is made of the electrode when the punch is employed in resection. Limited use of the electrode, I feel sure, leaves less coagulated and desiccated tissue after the operation, insuring more rapid convalescence and much less risk of subsequent bleeding. It has the still further advantage of leaving a less favorable field for secondary infection.

*Secondary infection.*—A vesical neck that recently has been subjected to transurethral resection, with its traumatized and coagulated surface, offers an ideal field for secondary infection. There seems little question but that the severe febrile reactions reported after transurethral resection are mainly the result of introduction into the vesical neck of organisms that are foreign to the patient.

Because of the large amount of irrigating fluid required during resection there is a tendency to be careless of its sterilization or of sterilization of its container. The fluid with which the bladder is irrigated following operation also should be cultured routinely, and scrupulous care should be exercised when irrigating the bladder through the catheter following operation. This should be done with the most exacting of aseptic precautions, and at the conclusion of the procedure the catheter should be attached to a sterile tube leading to a sterile collecting bottle. At no time can the end of the catheter be permitted to come in contact with any but sterile material without the certainty that at the next irrigation foreign organisms will be washed into the bladder.

If the catheters that are left in the urethra during the first forty-eight hours are of too great caliber they tend to encourage infection by not permitting the urethral secretions to drain freely from the meatus. There is a prevalent idea that if catheters are large, clots can be more easily evacuated and that, by producing pressure, they tend to check bleeding. Catheters are poor channels for the draining forth of clots, and pressure, by preventing drainage, increases infection. A number 20 or 22 French catheter is of sufficient size, and does not irritate an already traumatized urethra. The habit of allowing the urethral catheter to drain directly into a urinal cannot be too strongly condemned, for the ability of infecting microörganisms to pass up a urethral catheter has been demonstrated.

If these rigid aseptic precautions are followed before, during, and after operation, and if it can be demonstrated by routine cultures that the bacterial flora of the urine is the same during convalescence that it was during preparation for operation, the incidence of febrile reactions will be surprisingly few. At The Mayo Clinic, during 1932 and 1933, 79.05 per cent of the patients operated on never had a temperature higher than 101° F. at any time in the course of convalescence. A rigidly aseptic technic has proved of greater value in preventing febrile reactions than use of any urinary antiseptics we have tried.

*Strictures.*—Strictures of the urethra are indications of undue trauma, and should not be considered as a legitimate complication of transurethral resection. Resectoscopes are of large caliber and should not be passed until the urethra has been sufficiently dilated to receive them, and then only when adequately lubricated. Because the instrument must be so handled as frequently to compress the urethra against its walls, the operative procedure should not be too greatly prolonged. It is far preferable to remove the obstructing tissue in multiple stages than to continue the manipulative procedure until urethral trauma is so great as to produce stricture or periurethral abscesses.

The second operation is always easier than the first because the space from which tissue previously was removed gives more freedom of manipulation, and the edema that has occurred in the remaining tissue makes it more accessible for resection. If a second operation is decided on, the bladder must be kept empty between the operative procedures, for a traumatized vesical neck, in the presence of residual urine, is a fertile field for infection. Subsequent resections can be undertaken as soon as soreness of the urethra has subsided.

### CAUSES OF FAILURE TO RELIEVE THE CONDITION, AND REPORT OF SOME GOOD RESULTS

The most frequent cause of failure to relieve the condition is removal of an insufficient amount of tissue. When the operation is complete, there should be an adequate channel from the verumontanum to the floor of the bladder, circular in outline, with the edge cleanly cut away, so that there is an unobstructed view to the interureteric ridge. Merely to tunnel a hole under two overlapping lateral lobes, by removing a median obstruction, will not suffice. A sufficient portion of the lateral lobes must be excised to prevent their approximation, and the median lobe must be entirely removed. This may necessitate resecting more than half of the trigone, even up to the interureteric ridge, but unless this is done success will not be insured.

If the bladder empties to within one ounce (30 cc.) when the catheter is removed, the operator can feel assured that convalescence will be rapid and functional results gratifying. If residual urine persists, the chances of a second resection being necessary are considerable, and convalescence probably will be stormy.

Fortunately, in most cases of prostatic hypertrophy, less than twenty-five Gm. of tissue need

be removed to relieve the obstruction. Of the 721 cases in which resection was performed at The Mayo Clinic, in 1932 and 1933, in 191, or 26.27 per cent, the removed tissue weighed less than five Gm., in 209 cases, or 28.74 per cent, from five to ten Gm. and in 256 cases, or 35.5 per cent, from ten to twenty-five Gm., making a total of ninety per cent of cases in which the resected tissue weighed less than twenty-five Gm.

The operation was completed within a half hour in 227 cases, or 31.48 per cent, and within the hour in 348 other cases, or 48.20 per cent.

When the catheter was removed, usually at the end of forty-eight hours, in 85.71 per cent of the cases, the amount of residual urine was less than 150 cc. This amount usually decreased rapidly as the edema and congestion incident to resection subsided, so that at the time of dismissal of 721 patients who were subjected to resection in 1932 and 1933, 676, or 93.75 per cent had less than 15 cc. of residual urine.

In 1933, twelve per cent of the patients required multiple resections for complete relief of residual urine.

## CONCLUSIONS

The experience cited in this report would indicate that relief of urinary obstruction resulting from prostatic hypertrophy can be obtained by transurethral resection, with less risk and discomfort to the patient, and with a functional result equal to that obtained by prostatectomy. It is, however, a highly technical procedure, requiring special training and experience. Patients of physicians to whom such training and experience have not been available will derive more satisfactory results from prostatectomy.

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## DISCUSSION

CHAIRMAN DALAND: The discussion will be opened by Dr. Roger C. Graves, Boston.

DR. GRAVES: *Mr. Chairman, Guests, and Members of the Massachusetts Medical Society*—In spite of the fact that attempts have been made to remove portions of the prostate through the urethra since the days of Mercier in 1839, clinically safe and satisfactory methods were not developed until recent years. We are discussing therefore a still new procedure, but no surgical advance in the past decade has met more rapid widespread acceptance and none has provoked more vehement discussion. We can well afford to give it the earnest consideration that our Chairman has planned at this meeting, and we are indeed fortunate in that the subject could not have been presented by a more competent authority. It is a privilege to have heard Dr. Bumpus.

The advent of the modern methods of transurethral resection has converted it within a short space of time from an operation performed only in a few special clinics to one of common usage. This sudden change was followed by the usual reactions to something that is new. On the one hand have been those who hailed it as the solution of all obstructive prostatic difficulties, if not a short cut to surgical glory, while at the other extreme have been those who have stubbornly protested that the new thing must be dangerous because it represents a radical departure from the old. Both viewpoints are wrong, of course, and the Confucian doctrine of the mean would serve us well in this instance. When in doubt in the presence of three roads, take the middle.

I am sure that Dr. Bumpus will be better pleased with frank discussion than with mere passive agreement, and I shall venture therefore to give my own opinions. I feel that it is still far too early to assign to transurethral resection its final place in our therapeutic program, but I believe that it is a dramatic and invaluable addition to the surgery of the prostate. For the present at least it will not be safe to gauge its value entirely in terms of such brilliant results as those of Dr. Bumpus, though they will serve, to be sure, as an ideal toward which the rest of us may strive. We must consider also the probable average results of the average worker with this procedure which has been so widely adopted. And the ultimate critic will be the patient!

It is my present feeling that there are definite and clear-cut indications for this operation and that it is not a complete substitute for prostatectomy. Moreover, it is an operation of major importance and should not be undertaken except by those who are well grounded in the underlying principles of surgery in general, and genito-urinary surgery in particular, as well as in the technique of transurethral and intravesical manipulations. Never with safety can it be made an itinerant performance to be carried out wherever one may find it convenient to transport an electrotome. The signal success of Bumpus is proof enough of the need for an experienced group in a well-ordered clinic.

The clinical conditions which lend themselves favorably to prostatic resection through the urethra are, in my opinion, as follows:

*First*, the median bar, the small middle lobe, or the contracture of the vesical neck through fibrosis.

*Secondly*, those cases of carcinoma of the prostate, too advanced for total perineal extirpation, in which it is desirable and still possible to maintain normal bladder function without more extensive surgery.

*Thirdly*, those cases of benign hypertrophy in individuals who for one reason or another are not safe subjects for prostatectomy.

*Finally*, I believe that the success of transurethral resection will rest chiefly upon a proper selection and preparation of patients, adequate equipment and assistance, the careful avoidance of hemorrhage together with the avoidance of too drastic cutting and coagulation in the wrong regions, and the most meticulous precautions against infection, as the speaker has urged, not only in the operating room but at the bedside as well. The particular danger of infection has been well stressed by Dr. Bumpus, and in this he has performed a distinguished service. I hope that he will continue to emphasize it at every opportunity, for it has more bearing upon the casualties than any other single factor in this problem.

CHAIRMAN DALAND: The discussion will be continued by Dr. Walter D. Bieberbach, of Worcester.

DR. BIEBERBACH: I want to congratulate Dr. Bumpus for his especially fine presentation of transurethral resection. In discussing his paper it is hard for one to mention a choice of the best method and instrument for performing resections. I believe in deciding this very important point, that the operator should be well grounded in cystoscopy. He should be able to recognize the type of prostatic obstruction with which he is dealing and what section of the gland should be removed, so that when he has finished his resection the patient can empty his bladder without any great amount of residual. Next he will have to decide after due consideration what instrument and current will accomplish this work. To-day many instruments from the cautery punch to the electric loop have been cleverly developed by our leading urologists and both the tube and spark machines have finally found their place in prostatic resections. Of course to try all these machines and instruments in a satisfactory number of cases to make a choice seems almost impossible. However, I believe a man can decide what current and what instrument are most adaptable in his hands. After having made his decision I believe he should continue to perfect his technique.

Probably one man out of five after he passes the age of fifty years is confronted with some kind of prostatic trouble. It is the beginning of serious trouble which in the next few years may terminate his life if not carefully treated. It is here that I believe transurethral resection is going to be of the greatest importance. By careful cystoscopic examination the obstructing section of the prostate can be recognized before infection has taken place and the gland resected, thus saving his kidneys from future damage. An operation of this kind at this time can be done with relative safety and little inconvenience to the patient. I have done about forty cases, so my experience with resection has been somewhat limited. However, I have been satisfied with those I have done, knowing that if I had operated otherwise on many of these cases, my mortality would be somewhat high. In these forty cases I have not had a death and in the series several were inoperable malignant glands. A few of these are living and those who have since died lived out a fairly comfortable life and died of other complications. I know if I had operated as we formerly did upon these cases, they would have been miserable for the remainder of their lives. I did not choose all types of obstruction for resection. My cases have been confined to bar, small, hard, fibrous gland, contracture of the vesicle neck and malignant prostates. The large, soft adenomatous gland with large bilateral lobes introduced well into the bladder, I have reserved for open operation. Later when I have more courage I may attempt resection of this type.

In my work I have used the McCarthy resectoscope and tube machine. While many claim less hemorrhage with the spark type machine, in my series of cases I have never had any alarming bleeding or a condition necessitating suprapubic cystotomy for control of hemorrhage. In my later cases bleeding has been better controlled as I have become more adept with the instrument. When a part is resected, in many cases more or less surface bleeding can be seen. This may be slight or active. If the resecting loop with the coagulating current is lightly passed over the area, superficial coagulation appearing as a white surface can be easily recognized. The surface is not always smooth. It is broken at different areas and if one will carefully watch one of these imbedded areas, there will appear at different intervals jets of bright red blood. This is where an active vessel is bleeding.

If the loop of the resectoscope is buried in this fold and coagulation current turned on, the hemorrhage will be controlled. I believe it is from these areas that troublesome hemorrhage takes place and is wrongly classified as secondary hemorrhage. So may I suggest that each section that is resected be carefully inspected and watched for a short period of time before attempting further cutting. For bleeding that has not been entirely controlled at the time of resection, I have found the Herbst bag to be of advantage. In clean cases with a relatively short history of prostatism when there has been no considerable retention of long standing and no bladder infection with renal damage, there is no great amount of preoperative treatment required. These patients are cystoscoped, the prostate studied as to the location of the obstruction and the absolute need for resection. At this time the vas is divided either by open operation or tied off by the Davis method. An indwelling catheter is placed in the bladder for a few days during which time blood chemistry and renal function are done. If the general check-up is satisfactory, resection is then done under spinal anesthesia. The patient is returned to bed and watched for bleeding and irrigated every fifteen minutes for the next few hours with hot saline solution. The catheter is then allowed to remain in position for four or five days when it is removed. If the patient voids freely and has no trouble, in a few days he is examined for residual and watched at weekly intervals. I find that these cases do much better and the urine clears faster when left alone and not catheterized too often. Internal medication is given in the form of a urinary antiseptic, and moderate intake of fluid is advised. In the long-standing cases of prostatic obstruction, when infection and kidney damage are present, drainage is then carried out either by indwelling catheter or suprapubic drainage until they are in the best possible condition.

If these patients fail to respond to catheter drainage I immediately drain them from above. When the infection improves and the blood chemistry and renal function are within normal limits, the prostate is then resected. I find that these patients with marked bladder infection and renal damage do much better when they are drained suprapubically than when drainage is resorted to by indwelling catheter. I have also found a convenient way to control bleeding by inserting a Pilcher bag through the suprapubic incision.

I hardly feel that it is fair to expect good results in resection if the patient's prostatic obstruction has lasted over a long period of time with induced infection and kidney damage to the extent of a suppurative pyelonephritis where very little normal renal structure is left. In these cases the obstruction can be relieved but the patient will die from his upper urinary infection. It is therefore the duty of the physician to recognize these prostatic conditions early and see that proper treatment is applied. Intermittent catheterization and palliative prostatic care ultimately result in the death of the patient. Early and careful resection of properly selected cases will give the patient a great many more years of comfortable life. For the men that are not conservative and skillful in cystoscopy, transurethral resection should hold no place in surgery. When this fact is fully realized the present mortality will be greatly reduced.

CHAIRMAN DALAND: This is the second urological paper that has been delivered before this Section in the last fifteen years. I dislike to cut down the discussion, but I think we shall have to limit the discussion to about three minutes per man. The paper is now open for general discussion.

DR. JAMES B. HICKS: Dr. Bumpus' figures speak for themselves. To do 720 major operations of any description with the small mortality he reports is a surgical triumph. To do 720 prostatic operations in patients debilitated by age and cardiorenal diseases with this small mortality is to attain almost a surgical ideal. The fact also that no patients who presented themselves to Dr. Bumpus for treatment were refused operation shows that the transurethral form of operation enlarges the field of operability in these cases. In such a large series of prostatics, there must always be from two to four per cent who are considered too poor surgical risks for the enucleating types of operations. These patients are now treated by resection and it is surprising how well most of them withstand the treatment.

Soon after beginning the transurethral operation, to my mind, there were three great dangers to be encountered, namely, technical errors in operating, hemorrhage, and sepsis. The percentage of recurrence of the obstruction was also unknown. Dr. Bumpus has shown us the solution of these dangers by his report. Hemorrhage and sepsis can be controlled; the mortality can be kept low; good and lasting functional results can be expected.

There is no field of surgery where good judgment, thorough cystoscopic orientation, and attention to small details are better repaid than in the transurethral prostatic operations. Too deep fulgurating, ragged or irregular cutting or too much tissue removal at one time are the principal errors that lead to complications. Certainly, many of these patients are better operated in stages so as to avoid too much shock as well as to be able to better remove the obstructing tissue which in many instances cannot be well done at the first sitting due to the fact that, principally, the lateral lobe remnants have a tendency to drop or fall into the resected areas after a few days' interval.

During the last three years at the Lahey Clinic, we have subjected eighty patients to the transurethral form of operation. The cases represent all the different types of prostatic obstruction. There have been two deaths and several complications, most of which occurred early in our experience. Our results point in the general direction of those presented by Dr. Bumpus.

It is my opinion that transurethral prostatic surgery offers the prostatic patients a much less severe type of treatment than open operations, shorter hospital stays, and equally as good functional results.

DR. L. M. FELTON, Worcester: *Mr. Chairman and Gentlemen*—I want to thank Dr. Bumpus personally. I think he has saved me the trouble of a trip to Rochester, Minnesota. I have a few slides to present before the Society, and if you will permit me I would like to show them now.

DR. J. DELLINGER BARNEY, Boston: *Mr. Chairman*—I enjoyed both Dr. Bumpus' masterly presentation and the masterly manner in which he can handle resection. He perhaps did not lay enough stress upon the inexperience of the neophyte. Most of us, with the exception of Dr. Bumpus, Dr. Alcock, and Dr. McCarthy, are comparative amateurs.

I have done now about 100 cases. The first cases were very disastrous. There was a high mortality. During the last fifty cases there was no mortality. It is all due to the fact that it takes time to become accustomed to looking into the urethra and performing an operation with an instrument like the resectoscope. It takes time to adjust one's self to the thing one is seeing. I think those of us who have tried it have made serious mistakes in estimating the size of the gland or the exact manner of its enlargement. In one case I thought we had a small median lobe; the results were not satisfactory and we had to do a suprapubic cystotomy later, and upon opening the bladder we found two large lateral lobes. I think mistakes can be made, and I think that really, as Dr. Bumpus has said, it is an operation that requires no end of technical skill and no end of familiarity with instruments.

I have heard for some time about certain doctors making use of the operation, as being a procedure which practically anybody could do, who could look through a cystoscope. I do not think the urologist has any desire to keep all of this kind of material to himself by issuing a note of warning, but I think a note of warning should be issued to this effect: That, unless one is very thoroughly familiar with cystoscopic manipulation and with the appearance of the neck of the bladder under varying conditions, it should not be tried.

It is, however, an operation that is here to stay. I think there are certain contraindications to it, and as we get more familiar with it we will meet later on with the greatest success, because there is no doubt that in the hands of a master operator like Dr. Bumpus mortality is practically nil.

DR. J. A. SEAMAN, Springfield: *Mr. Chairman*—I think this record as presented here this afternoon by Dr. Bumpus is one of the most remarkable series of cases that I have seen anywhere. Certainly, I do not believe the literature can equal it and for the reason that I believe it is due to the artistry of the man who has done so many of them. True, he is working with a different type of cutting instrument, an instrument which is fine in his hands, but I also think it is due to his clever technique. It requires skill to mold the bladder neck as you would like to have it changed and to be able to do that with such little mortality (1%) and morbidity, in comparison with the results in most people's hands, I think is a triumph.

He has emphasized also the most important objections that have come out in recent years, and that is an absolute aseptic toilet in the handling of these cases postoperatively—the sterile tubing—in fact the sterile pathway from the bladder to and including the drainage jar. After all there is no reason why the urologist should not be as aseptic in his surgical technique as the surgeon.

He has not told us yet about his follow-up. I should be tremendously interested in that. We cannot claim much in the way of morbidity or mortality. We have had no deaths. We have done about forty or more cases to date. This is a small number but they are the cases that the doctor says should not be done, some of them, such as median bars, contracted bladder necks, carcinoma of the bladder neck, and middle lobes, but I have not had trouble with them because I use the McCarthy instrument, which I think is a splendid instrument, and the high tension spark-gap machine.

I would like to hear more of his follow-up, if there has been any follow-up to date. I am tremendously interested in his residual results. To have no residual in such a large series of cases is really quite an accomplishment. I am sure the morbidity and mortality will not even approach that of the orthodox prostatectomy whether by the suprapubic or the perineal route, particularly if cases are well selected and no attempt is made to excavate massive diseased tissue at the bladder neck. I wish to congratulate Dr. Bumpus.

CHAIRMAN DALAND: Will you close, Dr. Bumpus?

DR. BUMPUS: Several questions were asked about the preparation of the patient before operation and several others concerning the after-care. Time does

not permit of answering these except in the briefest form. Any preoperative preparation of a patient suffering with urinary obstruction should result in making that patient a better risk for operation. This is usually done by lessening the amount of urinary infection and improving the renal function by some form of drainage of the residual urine. If the patient has a normal renal function it is evident that it cannot be improved and if urinary infection is absent it cannot be removed. Obviously in such a case, to do any type of preliminary drainage in order to improve renal function or diminish infection is illogical. If the question of logic alone were involved it would not be a serious matter but the insertion of an indwelling urethral catheter for a week or ten days before operation may not alone be useless but can do great damage, for it irritates the urethra; frequently results in severe febrile reactions with chills and makes the patient a much worse surgical risk than he was prior to its insertion.

Last year we found that over half of our cases required no preparation prior to their operation. A fifth of them had such severe urinary infection or impaired renal function as to make a period of suprapubic drainage before resection necessary. The remaining one-third had either a permanent catheter for a few days or were subjected to intermittent catheterization and lavage prior to operation.

All patients are encouraged to remain in the hospital for at least a week, although many leave earlier. After the removal of the urethral catheter, usually at the end of forty-eight hours, the patient is catheterized daily and the bladder irrigated if any residual urine is present. When the residual has disappeared the irrigations are discontinued unless symptoms of cystitis develop. As no bleeding of any consequence has ever occurred after twenty-one days, the patients are kept under observation for that period of time before dismissal.

I doubt that the success of transurethral resection is so dependent upon the skill of the operator. To my mind there are three factors that spell success or failure. First, *minimum of coagulation.* When you coagulate tissue you destroy it and this destruction depends on the strength of the current together with its duration. Therefore, use the least amount of current for the shortest possible time that will give adequate hemostasis. Secondly, *infection.* If no new organism foreign to the host is introduced either before, during or after operation febrile reactions and stormy convalescences will be few. To do this requires the most stringent aseptic technique throughout convalescence, as well as at operation. Thirdly, *the removal of sufficient tissue.* Unless sufficient tissue is resected to result in the complete emptying of the bladder the urinary tract has simply been severely traumatized without correction of the obstruction and in the presence of residual urine a stormy convalescence may be anticipated.

CHAIRMAN DALAND: The next speaker is an old friend of all Massachusetts surgeons, and he visits us all freely and allows us to visit him. I am glad to introduce Dr. Clay Ray Murray, Assistant Professor of Surgery at Columbia University.

# THE TREATMENT OF FRACTURES ABOUT THE ANKLE JOINT*

BY CLAY RAY MURRAY, M.D.†

THERE is a lamentable tendency in surgical circles to discuss fractures about the ankle joint under the generic term "Pott's Fracture". This is unfortunate, not only because of the looseness and inaccuracy of the nomenclature, but because of an implied similarity in treatment for these fractures as a group. Such an implication is far from being true. Fractures about the ankle represent a most diversified group from a therapeutic standpoint.

One may classify these fractures on numerous bases of comparison. For our purpose I shall group them according to similarities along three lines: disturbed function, treatment principles involved, and time of disability. This may not be a particularly scientific grouping, but it is an eminently practical one. It attempts to answer two questions: What is to be done, and how long will the patient be "laid up".

## GROUP ONE

This group consists of those cases in which the functional disturbance is purely that of soft part damage, and is secondary to pain, swelling and inflammatory reaction. It includes fractures of either malleolus, or both, showing neither separation nor displacement of the fragments (fig. 1). Bony union is the rule in all.

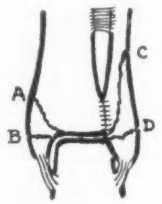


FIGURE 1.

The line may be either transverse, as in B and D, or oblique, as in A and C, depending upon the mechanism.

Though this is the simplest group, it is one in which unnecessary prolongation of disability is frequently the rule. The treatment is essentially the abolition of soft part pathology through rest and elevation of the part; cold applications in the first twelve to twenty-four hours, heat thereafter; the use of light massage from the twenty-four hour period on; the use of active motion within pain limits for frequent short periods during the day as early in the treatment as possible. Rest of the part is best enforced by a posterior molded plaster of Paris splint (fig. 2), which need extend only to the knee. Until the soft part pathology is pretty

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†Murray, Clay Ray—Assistant Professor of Surgery, Columbia University College of Physicians and Surgeons. For record and address of author see "This Week's Issue," page 895.

well abolished, a period of two to seven days, I am sure that time is saved by bed rest of the patient. The cold applications for the first twelve to twenty-four hours may be iced cloths or an icebag, and the heat after the first twenty-four hours is best applied as constant heat of low intensity. A pair of ordinary light bulbs beneath a tent improvised over the feet is extremely satisfactory, and of much more value than the application of intense heat, as from one of the therapeutic lamps, at relatively infrequent intervals. The massage for the first few

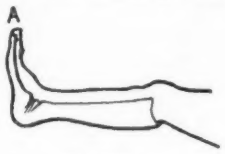


FIGURE 2.

The plaster must be closely molded to the shape of the parts, and extend beyond the toes at A to obviate pressure by bed clothes.

days can be given with the unbandaged splint in situ; after forty-eight hours it is usually possible to remove the splint for the light stroking massage, and to remove it for active motion within pain limits four to six times daily, the initial periods consisting of a few motions only, gradually increasing as pathology disappears, and with its disappearance pain and stiffness lessen. Frequent short periods of exercise are to be preferred to infrequent and prolonged periods. When the soft part pathology has been adequately reduced, some form of elastic bandage is put on from the base of the toes up to the knee, and the patient is allowed up on crutches. In allowing him up, the foot is not to be dependent more than five minutes out of the hour on the first day, and this time is gradually increased, gauged by the amount of swelling, until there is no limitation. No weight is borne for the first seven to ten days. Then gradually increasing weight-bearing is instituted with the crutches. By the end of the second week the crutches are replaced by a cane and the splint is replaced by supportive strapping or by an adequate leather ankle brace, preferably of the type used in skating, with lateral and medial whalebone supports. This latter should be worn steadily for four weeks, and during the next three months it should be worn whenever violent exercise is attempted. Exercises and massage are to be continued to the end of the third week, and during the third week, if swelling on dependency is at all a noticeable factor, alternating hot and cold plunges for the foot and ankle, night and morning, may be very helpful. One minute in hot water and one half minute in cold water, alternating, over a period of fifteen minutes is adequate. If swelling on dependency remains a notable feature, the use of the elastic bandage or stocking should be prolonged as need be. Where the soft part pathology has been great, and the swelling marked, I have frequently had patients wear this support for six or nine months.

If this régime is followed, the average period of disability, i.e., inability to work, should be about three weeks. Clerical workers with relatively light soft part damage may be back at work in two weeks or less. Those doing heavy labor may have to delay full industrial use to four or five weeks with the support of the ankle brace. These figures will seldom need to be exceeded unless some other factor enters the case, such as unwillingness of the patient to do as he is told (whether through fear or through elements connected with his compensation, industrial or legal), or some other complicating factor not connected with the injury directly.

It is a matter of interest here, as it is frequently in other fractures where early active motion within pain limits is advised, that a hemarthrosis is often present in the joint, in this instance the ankle joint. If this be under tension, as it frequently is, it accounts for the marked pain, increased by the slightest motion, which may be a feature of these cases, although there is no bony deformity or marked pathology. All talk of early motion within pain limits under such circumstances is ridiculous. If such hemarthrosis exists, it is evidenced by swelling in front of and above the end of the external malleolus and beneath the common extensor tendons. Very slight pressure at these points will reveal not only tension but exquisite tenderness. In every such instance aspiration of the joint is indicated, and will be followed not only by the relief of pain but by a striking range of painless motion. We have secured as much as fifteen cubic centimeters of blood from such a joint, and aspirate routinely in the presence of the picture which I have described. Logically enough the hemarthrosis is not present when there is actual displacement of bone fragments or wide tearing of ligaments, as the joint then ceases to be a closed cavity and bleeding into it does not cause tension. The therapeutic significance of these observations is frequently ignored or overlooked.

The aspiration of the joint is to be done through a point two and one half centimeters above the tip of the external malleolus and one centimeter anterior to its anterior border. As with all joint aspirations, a skin bleb should be raised with novocain, after shaving and meticulously cleansing the skin, and a small nick made through the skin with a scalpel. The novocainizing of the deeper tissues, including a small amount into the joint cavity, and the aspiration are then done through the skin nick without the necessity of passing the needle through skin into the joint. Although we have done many punctures in following this routine in ankles, wrists, knees, elbows, and occasionally shoulders, we have never had the slightest suggestion of infection in any case.

GROUP TWO

The functional disturbance in this group is due to malposition of the foot, which is commonly somewhat inverted or everted, dependent upon the mechanism of the injury, and may be displaced slightly outwards as well (fig. 3). The

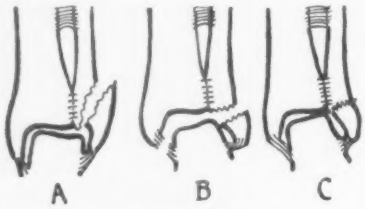


FIGURE 3.

Inversion, as in A, or eversion, as in B and C, may occur, and actual lateral shift of the foot may take place when the pathology is as in B.

integrity of the mortise of the ankle joint per se is not disturbed. The group embraces all fractures of the external malleolus below or outside the inferior tibiofibular joint, with displacement of the fragment.

The treatment of this group differs but slightly from that of the preceding one. The first difference lies in the necessity for reduction, i.e., the replacement of the foot and malleolus in their normal relationships with the tibia and fibula respectively, and in the necessity of maintaining the normal positions until healing has occurred. Healing, in the external malleolus, is almost invariably bony and rapid. Two weeks ordinarily sees it accomplished, and is usually the maximum time indicated for undisturbed splinting. Frequently ten days is sufficient when the deformity has been largely an angular one or the separation moderate. The splinting used is slightly different from that used in the previous group (fig. 4). Either a

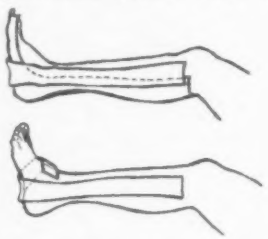

FIGURE 4.

The upper diagram illustrates the posterior molded splint, similar to that in fig. 2, plus a "sugar tongs" which overlies it, passing from below the knee on the outer side down to the sole, across the sole, and up the inner side to just below the knee.

The lower diagram illustrates the splint called after Lewis Stimson, starting below the knee on the outer side, passing under the sole to the inner side, and coming up thence over the dorsum of the foot.

Accurate molding of all splints is essential.

posterior molded and sugar tong below the knee, or the Stimson type of splint may be utilized. The same use is made of cold, heat, and elevation as in the previous group, but the massage and active motion of the ankle must be delayed for from ten days to two weeks. During this time, however, active movements of the toes and knee and hip exercises are well worth insisting on at hourly intervals after the first twenty-four to forty-eight hours. As soon as the soft part pathology is sufficiently abolished the patient can be allowed up as in the previous group, and gradual resumption of dependency established as in that group. At the end of the ten days or two weeks the splints may be removed for massage, exercise, and plunges as in the previous group, but are worn at night until the end of the third week. From the eighteenth to the twenty-first day weight-bearing with the ankle brace may be instituted, going from crutch to cane. The average period of disability in these cases will run to about four weeks. Clerical work can frequently be started in the third week, and full heavy labor may have to wait until the sixth week, subject to the same restrictions as apply to the previous group. Hemarthrosis may be a factor, and if present should be aspirated before reduction of the fracture.

GROUP THREE

This group presents a disturbance of function characterized by inversion or eversion of the foot, dependent upon the mechanism, with almost any possible displacement of the foot on the tibia. It includes fractures of the internal malleolus with separation and displacement of the two types shown in fig. 5, and bimalleolar

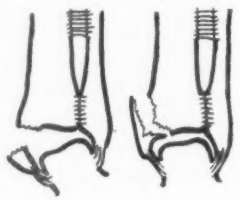

FIGURE 5.

The figure on the left illustrates the type in which union is very frequently fibrous, that on the right the type in which union is nearly always bony.

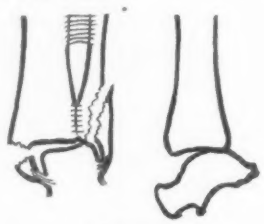

FIGURE 6.

The bimalleolar fracture. The foot is free, and may occupy any position. Backward displacement is common.

fractures (fig. 6), all without involvement of the inferior tibiofibular joint. The disturbed function is twofold, that of malposition of the foot in relation to the tibia, and possible widening of the ankle joint mortise by reason of the malleolar displacements, although the tie bolt of the mortise, the inferior tibiofibular joint, is intact. It is merely the projecting arms that are broken off. The treatment indicated is obvious: put the displaced projecting arms of the mortise back in position, i.e., replace the malleoli, and

hold them in place until they heal. Obviously where the fracture involves only the internal malleolus, the reduction consists in replacing that bony fragment. In no case is the replacement of either malleolus accomplished by inversion or eversion of the foot, although in practise this fallacious idea seems widespread. The replacement of the foot in normal relationship with the tibia is the first procedure, followed by actual digital manipulation of the malleoli into their proper positions. In these positions they are held by digital pressure until the pressure of the molded splint takes its place. This means until the splint has hardened. The molding of the splint about the malleoli, particularly the inner one, is an essential point in maintaining the reduced position. When it is inadequately done, it is frequently found that a malleolus which under the fluoroscope seemed accurately reduced is seen by x-ray after splinting to have again separated.

The position of the immobilized foot at the ankle in any of the fractures here discussed is that of slight inversion and a right angle or slightly less, unless specifically designated otherwise. This is a position of immobilization and has nothing to do with reduction. It is based on the idea of minimizing soft part functional disability later, and is specifically designed to prevent contracture of the calf muscles with a talipes equinus deformity, and to promote shortening or contracture of the internal lateral ligament of the ankle joint and the supinators of the foot as a protection against pronation with traumatic weak foot later. The instances wherein either the inversion (supination) or dorsiflexion needs to be exaggerated are few and far between, and occur only rarely in groups to be later discussed. I have never seen a fracture involving the tibia or fibula where immobilization in eversion (pronation) has been indicated.

The time of immobilization in this group is

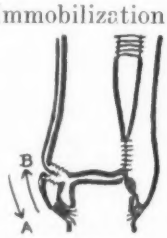


FIGURE 7.

With both the producing force of A and the replacement force of B the torn and frayed ligament and periosteum tend to be pulled or pushed over the fracture surfaces.

dependent on the healing time of the slowest healing lesion present. This is the fracture of the internal malleolus. When the fracture here is markedly oblique in character the healing is practically always bony. When the fracture is transverse in character the healing is most often a fibrous union for many months at least, and frequently as a permanent result. This is an interesting observation, and I am inclined to think, on the basis of operative findings on a number of fresh cases, that the non union in this latter group is due to the interposition of frayed ligament and periosteum when replacement is accomplished (fig. 7). At any rate, healing in all types of internal malleolar fractures is slower than those of the external malleolus. It is only necessary, however, to have sufficiently dense fibrous union to accomplish function. In follow-ups on many cases of internal malleolus fracture, with and without external malleolar involvement, where reasonably accurate replacement has been accomplished and maintained, and where fibrous union has been the end-result, I have never seen a case showing residual symptoms attributable to the fibrous union.

The accomplishment of bony or adequate fibrous union in the internal malleolus fractures in this group takes upon the average close to four weeks. Before this time the external malleolus has practically united by bony union. Thus the average time of splinting required in these cases is four weeks. The type of splinting varies in that if the fracture is bimalleolar the splints are best applied extending above the knee for the first ten days to two weeks. In this instance the type of splinting used is shown in Fig. 8. At the ten-day or two-week period the

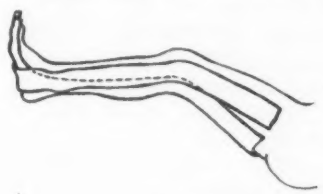

FIGURE 8.

The splints, similar to those in fig. 4, upper diagram, differ in extending as far above the knee as it is possible to get them. It is a mistake to stop them just above the knee.

splints are cut down below the knee to correspond to those shown in fig. 4, the posterior and sugar tong. Where the internal malleolus alone is involved the latter splint may be used from the outset. The treatment after reduction follows the lines laid down for the previous groups, the splints being removed intermittently for massage and periods of exercise at the end of the second week if the displacement has been slight or moderate and at the end of the third week if it has been marked. The time for dependency and crutches without weight-bearing is based, as in other groups, on the state of the soft part pathology. Weight-bearing with the protective ankle brace is started at four weeks, and full function at an average of seven weeks. Five weeks may see full function for those who have but little strain to put on foot and ankle, and eight weeks or more may be needed for those whose work entails heavy strain. The elastic bandage is put on beneath the splints at the time of their first removal for massage and exercise.

GROUP FOUR

This group comprises the only cases which should be included in the term Pott's fracture. It is a fracture of relatively infrequent occurrence. The difference between it and the other groups described lies in a mortise widened by tearing of the inferior tibiofibular ligaments, with disruption of that joint and a separation of the tibia and fibula. This may be accompanied by a fracture of the internal malleolus or a tear of the internal lateral ligament of the ankle joint without malleolar fracture, and is almost invariably accompanied by a high fracture of the fibula, oblique, spiral, or almost transverse, two to two and a half inches from the tip of the malleolus (fig. 9). It is a fas-

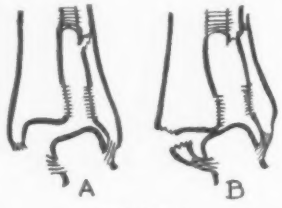


FIGURE 9.

The true Pott's fracture, with disruption of the inferior tibiofibular joint, high fracture of the fibula, and either tearing of the internal lateral ligament (A) or fracture of the internal malleolus (B). The essential feature is rupture of the inferior tibiofibular ligaments.

cinating fracture from the standpoint of the etiological mechanics involved, but, as these are not concerned in the treatment of the case, discussion of them is not warranted. Suffice it to say that the disturbance of function is based on the displacement of the foot outward, and usually backward, the latter displacement being possible because the widened mortise allows the wide anterior portion of the astragalus to pass backward (fig. 10). Furthermore, a sit-

FIGURE 10.

The posterior displacement in a Pott's, identical with that of a bimalleolar fracture, possible in both instances through widening of the mortise.

uation peculiar to this fracture, the widened mortise, still remains after any displacements of broken fragments have been corrected (fig. 11). We have, therefore, the problem in the reduction of first replacing the foot in its normal relationships with the tibia, then replacing in their normal positions the fractures of the tibial malleolus (if present) and of the fibula, and, finally, of bringing together the apposing faces of tibia and fibula at the inferior tibiofibular joint. This triple restitution, then, has to be maintained until healing is sufficiently strong to hold the normal position. Weight-bearing has to be delayed until the healing of the inferior tibiofibular ligaments is not only accomplished, but until that healing is strong enough to stand the strain without stretching, since the mortise would hereby again be widened with a resultant unstable ankle. Improperly treated this is a most disabling injury, and I feel that it is worth while to give rather a detailed description of

FIGURE 11.

Showing persistence of widened mortise in Pott's, even after *bony* displacements are corrected.

the reduction and splinting of this fracture, interposing reference to the other groups which we have considered when the maneuvers described have any bearing on them.

All ankle fracture reductions are best done with the knee flexed, since the hamstrings are then relaxed and their pull on the foot diminished, and because countertraction can then be made on the flexed thigh, avoiding interference with the application of the splints (fig. 12).

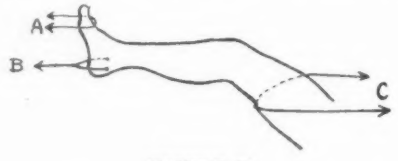


FIGURE 12.

Reduction of Pott's. A—downward traction by hand over dorsum. B—downward traction by palm of other hand grasping heel. B must exceed A. C—countertraction against thigh with flexed knee. Purpose of maneuver—stretching of calf muscles and reduction of any upward displacement.

While countertraction as indicated is made by an assistant or by a band passing backwards or any other mechanical equivalent, the operator exerts steady downward traction on the foot, grasping the heel with one hand and the dorsum of the foot with the other. This serves to relax further the hamstring muscles, and is also invaluable in the reduction of one of the complicating lesions that may be present, and will be referred to later. This traction should be steady, strong, and long-continued, lasting for several minutes. If adequately performed it tends to make the subsequent maneuvers easier and more apt to be successful. There should never be any element of jerking employed. After this traction has been maintained steadily for from three to five minutes with both hands, the one over the dorsum of the foot is released, and is used to press backward on the crest of the tibia just above the ankle joint; the hand grasping the heel now is not only maintaining the downward traction, but is forcing the foot

forward against the backward counterpressure of the hand on the front of the tibia. This serves to correct the backward displacement of the foot. The base of the palm and the thumb of the hand which is holding the heel is then applied to the external malleolus, the downward traction being maintained, and the free hand is shifted from the front of the tibia and is applied to the inner face of the tibia just above the ankle joint. Between these two points of pressure the fibular malleolus and the tibia are forced into contact, reducing the disruption of the two bones at the inferior tibiofibular joint. The two surfaces will stay in contact only so long as this compression is exercised. It can be maintained with the fingers and thumb of one hand, and the internal malleolus, if it has been fractured, replaced with the fingers of the other. The splints applied are those illustrated in fig. 8, extending above the knee. They must be applied by an assistant, and the hands of the operator must be shifted about during the application so as to maintain at all times the compression at the inferior tibiofibular joint and the position of the internal malleolus, molding the plaster to maintain the latter. Only when the plaster has hardened is it sufficient to maintain position. It is particularly in this fracture that undue inversion is damaging, as it tends to reproduce the widening of the joint which we have been at such pains to correct. A glance at figs. 13 to 16 will perhaps serve to clarify this picture.

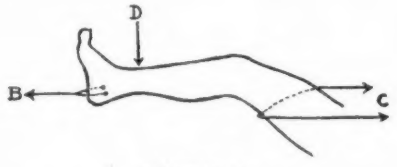


FIGURE 13.

Hand making A traction in fig. 12 now makes backward pressure at D with heel of palm. Purpose of maneuver—to correct posterior displacement of foot while correction of any upward displacement is maintained.

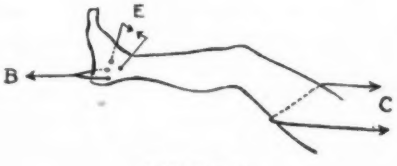


FIGURE 14.

Fingers of hand making backward pressure at D in fig. 13 now press lower tibia and fibula tightly together, reducing disruption of inferior tibiofibular joint. When they are firmly pressed together both the traction B and the backward pressure D (fig. 13) may be released, since, with restoration of the mortise, displacement of the foot cannot occur.

Following the reduction the routine is as in the other groups, except that the splints in these cases cannot be removed for a period of four to six weeks without endangering the reduction of the disrupted inferior tibiofibular joint. They can be cut below the knee at the end of the second week, and toe movements and knee and hip exercises can be used, but massage and ankle movements have to be delayed until after the fourth week when the disruption has been moderate, or to the sixth week when it has been marked. This prolonged absolute immobilization is one of the reasons why a real Pott's fracture has swelling on dependency of the leg for a long period of time.

Because of the nature of the healing, weight-bearing is delayed for from six to eight weeks, and unaided weight-bearing does not take place until the ninth or tenth week. The disability time for these cases is between twelve and sixteen weeks, depending on the severity of the lesion.

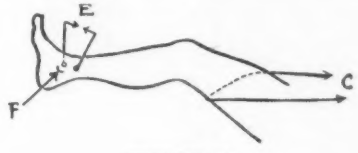


FIGURE 15.

Pressure (fig. 14) maintained, and hand formerly making traction B manipulates internal malleolus into accurate alignment (F).

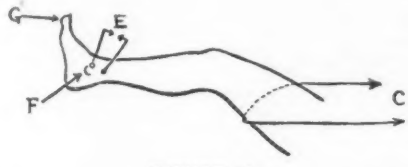


FIGURE 16.

Hand holding internal malleolus in accurate alignment (F) also holds foot at right angle to leg and in slight inversion (G).

Because of these facts, and since the prolonged disability is secondary to the disruption of the inferior tibiofibular joint and the inadequacy of the freshly healed ligaments for weight-bearing, I have long felt that in qualified hands, and with proper equipment and assistance, the best treatment for these cases involves actual operative reduction and fixation. One can then dispense with practically all postoperative splinting, and the use of physiotherapy and active motion of the ankle can be instituted within a few days of operation. Weight-bearing with crutches can be started in two weeks, and full weight-bearing allowed in four to five weeks. A case so treated recently was discharged from all treatment in six weeks, and was working full time as a stenographer and typist, traveling by New York Subway to and from work without crutch or cane. Her active motion was started within a few days of operation. A short posterior molded splint was worn between periods of exercise for about a week, and when the wounds were healed at seven days, massage was instituted. The fixation in this case was by steel screws and bolts. Figs. 17 and 18 show the lesion, a somewhat complicated one, and the operative reduction and fixation. There is no question that the disability period can be

greatly reduced by this procedure, but there is also no question but that it can only be done under conditions optimum for the success of open reductions on fresh fractures.

There are three other groups warranting some discussion.

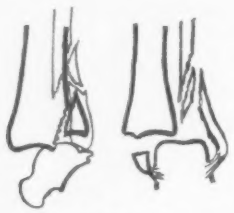

FIGURE 17.

Fracture before reduction. Comminution of fibula, disruption of inferior tibiofibular joint, fracture posterior lip of tibia, and fracture of internal malleolus. Foot displaced outward, backward, and upward.

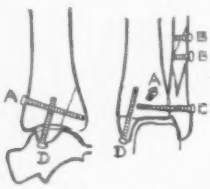


FIGURE 18.

Post-reduction on fracture shown in fig. 17.
A—Screw from front face of tibia through reduced posterior lip.
BB—Small screws fixing loose fibular fragments.
C—Screw holding reduction of inferior tibiofibular disruption.
D—Screw holding reduced internal malleolus.

GROUP FIVE

This group comprises those cases in which the essential lesion is a comminution and impaction of the lower tibial articular surface, usually by a fall from a height, the foot driving the astragalus up against the tibia (fig. 19).

FIGURE 19.

Dotted line indicates normal level of ankle joint articular surface of tibia.

Some of these may theoretically be pulled down by the use of traction via a pin or wire through the os calcis. My own experience with such procedure has never been satisfactory. Operative correction may be possible when the comminution has not been too severe. Fixation is difficult and weight-bearing has to be delayed until the healing is strong enough to bear it. This is frequently ten to twelve weeks. I have no recollection of any case of this type showing an end result symptom free. I am inclined to believe that where the residual symptoms constitute a real handicap in an individual who has to do heavy work, or to climb stairs or ladders, an arthrodesis of the ankle joint is indicated.

GROUP SIX

In this group I have placed those fractures which are practically never seen alone, but almost invariably as complications of one of the first four groups. The effect of their presence is to complicate the reduction, or to prevent it, and to delay weight-bearing in all except the fourth group. There are three fractures in this group: those of the anterior tibial lip (fig. 20);

FIGURE 20.

Forward and upward displacement of foot which may accompany anterior lip fracture.

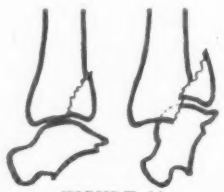

FIGURE 21.

Type and displacement with posterior lip fracture.

those of the posterior tibial lip (fig. 21); those of either lip, usually the posterior, of the tibial face of the inferior tibiofibular joint (fig. 22).

FIGURE 22.

Fracture with separation of lip of inferior tibiofibular joint complicating Pott's fracture. The difficulty which may arise in attempted reduction of the disruption is obvious.

Those of the anterior tibial lip add two complications to the treatment of the case. The reduction is frequently difficult or impossible by manual means. Downward traction on the foot in marked plantar flexion sometimes succeeds. Pin traction or wire traction is usually unavailing. Operative fixation may be enforced. In addition to the difficulty of reduction it is necessary, if the fracture be manually reduced, to keep the foot in plantar flexion until healing has occurred. This is far from a desirable procedure, and operative reduction and fixation seems preferable if the necessary facilities are at hand. I have reduced and held a fracture of this type without open operation by impaling the fragment on a Steinmann pin through a skin nick, pulling it down into place under fluoroscopic control with the pin as a lever, and then driving the pin on through the main body of the tibia, thus fixing the fragment. The

pin was then incorporated in plaster applied for coincident malleolar fractures (fig. 23).

The posterior lip fractures are also frequently difficult to pull down and hold. It is in these that flexion of the knee is invaluable through relaxing the hamstrings. In addition, the traction must be made with the foot in forced dorsiflexion, and it is often necessary to keep this forced position during immobilization. If manual reduction fails, pin or wire traction through the os calcis with the flexed knee will often succeed in these, in contradistinction to the anterior lip fractures. This upward displacement of the posterior lip is important to reduce since it allows the astragalus to slide backward and upward on the tibia, and may entail considerable disability, particularly on stairs and ladders, in running, and in squatting. If manual efforts or skeletal traction leave the displacement still

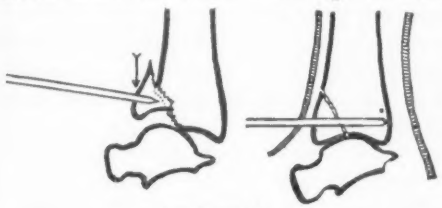

FIGURE 23.

Left—pin (Steinmann) embedded in anterior lip fracture, and used to make direct downward pull.
Right—following reduction; pin driven through remainder of tibia and incorporated in plaster.

marked, operative fixation is indicated.

In fractures of the fourth group one occasionally sees one of the lips of the tibial articular face of the inferior tibiofibular joint torn off as a complication of the disruption of the joint. It is of importance in that it may interpose itself between tibia and fibula when reduction of the joint disruption is attempted. When this happens the only recourse is operative reduction.

GROUP SEVEN

I have included here a series of cases in which the very tip of either malleolus is torn off as part of a sprain. They are called malleolar fractures by many, but are fractures in name only. The lesion is essentially a ligamentous tear, and should be classed as a sprain of the joint, and treated as such. When it is the inner malleolus which is involved the lesion requires careful treatment because of the tear and lengthening of the internal lateral ligament.

A few words in closing in reference to the use of the so-called Böhler walking leg plasters, featuring leg irons in unpadded plaster applied directly to the skin. By their use it is possible to start weight-bearing on the extremity, although not on the ankle, very early, and the resultant muscular activity is unquestionably of value in hastening convalescence. There are, however, two points to keep in mind if they are to be used. One is that their whole value disappears unless the patient starts walking on them practically from the beginning of the case. The second is that unless they are very carefully applied and fitted they will not only fail to fulfill their purpose, but will cause pain and pressure sores. If they are carefully and properly applied, and if the patient gives them the use they are supposed to get, I think that they shorten the disability period. But one should be sure of both these points before entering upon the use of them.

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DISCUSSION

CHAIRMAN DALAND: The discussion will be opened by Dr. Frederic J. Cotton, of Boston.

DR. COTTON: It has been one of my valued privileges for some years past to disagree with Clay Murray, and in this instance I am not going to agree with him entirely; but, in the first place, I want to say, so far as the treatment of ankle fractures is concerned, his is a treatment of which I not only have no criticism but am, in every instance he brought up, entirely in agreement as to the way of going at it.

The matter in which I disagree is the manner of presentation. In the first place, I think we already have too many classifications, and it seems to me the reclassification in this instance is not needed, and I do not think it is a useful one. I adhere to what I have said often enough, that the important thing in ankle fractures is not so much the detail of the bone breaks as the direction of total displacement. This is important because consideration of it makes it possible, even without regard for x-rays, to get an approximate reduction, usually efficient and prompt, and the early reduction of fractures of this sort is important, not only because it can be more exact, but because, as Darrach has pointed out, it has a definite bearing on end-results in the way of repair.

It seems to me that a classification on this line is more practical for the general man who, after all, is going to see these fractures. I am interested to note the emphasis which Dr. Murray places on the matter of diastasis between tibia and fibula, and his clear exposition of the rôle of the astragalus in prying these bones apart especially in Pott's fracture, where too pronounced inversion has often been the rule of treatment, and a bad rule.

I am sorry, also, that Dr. Murray did not include in his ankle fractures what after all is an ankle fracture and the worst of the lot, what I have made my "Class 4," with displacement upward, the fracture in which the lower part of the tibia is shattered, with an ascent of the foot, the fibula often unbroken, and even if broken, out of relation to the foot. These are common and unless very competently treated by traction, with or without pinning, are apt to be extremely disastrous.

CHAIRMAN DALAND: The discussion will be continued by Dr. Charles L. Scudder, of Boston.

DR. SCUDDER: In the three minutes remaining for discussion I would like to say three things: The presentation by Dr. Murray of certain uncomplicated injuries in and about the ankle joint has been particularly happy. Dr. Murray has clearly defined these lesions, he has suggested ways of treatment and he has stressed the care that these cases require after treatment has been begun.

I would call attention to two matters which ap-

pear to me of considerable importance in connection with injuries near the ankle.

There are fractures of the lower end of the tibial shaft entering the ankle joint which are difficult to reduce. The comminution and obliquity of the fracture may preclude the direct operative treatment. Such cases cannot ordinarily be adequately treated by manual traction. I believe that the use of pulley traction, as obtained by the Soutter traction apparatus, will make it possible to snug fragments together and to reduce the fracture satisfactorily.

The second matter that seems relevant in this connection is that the normal weight-bearing planes must be restored by not only as nearly as possible repositioning of the fracture fragments, but that the complete coöperation of the injured individual is essential in securing the maximum degree of movement at the ankle joint and in the metatarsal joints. These fractures are always important. They may result in great disability. Correct immediate treatment is desirable.

CHAIRMAN DALAND: The meeting is adjourned.

## MORTALITY RATES

Telegraphic returns from 86 cities, with a total population of thirty-seven millions for the week ending October 20, indicate a mortality rate of 10.9 as against a rate of 10.7 for the corresponding week of last year. The highest rate (17.1) appears for Wilmington, Del., and the lowest (4.6) for Waterbury, Conn. The highest infant mortality rate (17.2) appears for Albany, N. Y., and the lowest for Evansville, Ind., Lynn, Mass., Portland, Ore., South Bend, Ind., Waterbury, Conn., and Yonkers, N. Y., which reported no infant mortality.

The annual rate for 86 cities is 11.3 for the forty-two weeks of 1934, as against a rate of 10.8 for the corresponding period of the previous year.

SUMMARY OF DEATHS AND DEATH RATES (ANNUAL BASIS) FROM AUTOMOBILE ACCIDENTS PER 100,000 ESTIMATED POPULATION FOR 86 CITIES FOR CORRESPONDING PERIODS OF 1934 AND 1933

| | Week ending | | First 42 weeks | |
|---|---|---|---|---|
| | Oct. 20, 1934 | Oct. 21, 1933 | 1934 | 1933 |
| Total deaths | 190 | 212 | 6,719 | 6,237 |
| Death rate | 26.5 | 29.5 | 22.3 | 20.7 |
| Deaths due to accidents in city | 142 | 156 | 5,252 | 4,880 |
| Death rate | 19.8 | 21.7 | 17.4 | 16.2 |

## QUINTUPLETS' WEIGHT IS HIGH

Normal babies should double their birth weight in five months, physicians say, but the Dionne quintuplets, premature by two months and anything but normal, have done far better than that. On their five-months birthday, all five sisters were more than four times as heavy as when first accurate weights were taken. Their total weight then was only 10 pounds, 1¼ ounces. Now it is 45 pounds, 10 ounces.—*N. Y. Times.*

## MEDICAL DIRECTOR UNDER F.E.R.A.

Although medical aid for persons on relief under F.E.R.A. will be supplied, according to Dr. Clifford E. Walker, Medical Director, there is no intention of carrying the burden ordinarily taken over by local and health authorities.

Efforts will be made to control nutritional diseases.

Dr. Walker expects to have medical directors appointed for all the states, although only eight now have full-time directors.

## HOSPITAL INSURANCE ENDORSED BY THE EDITOR OF THE *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* BEFORE THE TEMPLE CLUB*

Hospital insurance plans such as those proposed by the Hospital Council of Rochester, New York, are feasible so long as they maintain the present responsibility between doctor and patient.

In substance, the Editor of the *Journal of the American Medical Association* gave qualified approval to the program in a recent address to the Temple Club of B'rith Kodesh at Rochester, New York.

"The plan of permitting individuals to pay a nominal sum annually as insurance for hospital care when it will be needed is a sound and feasible one," he said. "The American Medical Association has given its indorsement provided the individual responsibility between doctor and patient is maintained. It should be a voluntary and not a compulsory program and doesn't mean much unless there is coöperation among all hospitals in the community."

*Taken from a Rochester, New York, newspaper report.

# CASE RECORDS
## *of the*
# MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.

## CASE 20451

### PRESENTATION OF CASE

A fifty-nine year old American painter entered the Eye and Ear Infirmary complaining of increasing hoarseness and difficulty in swallowing.

Approximately six months before admission the patient noticed that his voice was becoming hoarse. This change in voice continued until two months before entry, when it became much higher pitched than it ever had been. At this time he began to experience difficulty in swallowing solid food. He was able to take liquids. The pain during swallowing was severe and located in the substernal notch. Occasionally the swallowing would cause a paroxysm of coughing associated with blood-streaked sputum. The sputum, however, was never very great in amount. During this illness there were occasions when he coughed three or four times a day when not eating. During the past two months he noticed that his breathing was slightly impaired during exertion. His appetite had decreased and his weight had fallen from 147 to 125 pounds. There had been no change in his bowel movements.

His father, brother, sister and niece all suffered from asthma. There was no history of tuberculosis or cancer.

The patient had been married thirty-four years. His wife was living and well. There were no pregnancies.

For several years he had been troubled with gas, without pain, approximately one half hour following meals. This was relieved by soda. This condition had disappeared however during the past year. He had no other gastro-intestinal difficulties. There was no history of chest pain, palpitation, edema or night sweats.

Physical examination showed a well-developed and fairly well-nourished middle-aged man with marked swelling of the veins of the head and neck. There was a marked tracheal tug. There was bilateral abductor paralysis of the larynx. Examination of the lungs showed coarse rhonchi. The supracardiac dullness measured approximately 7 cm. The heart was believed to be enlarged. With the patient on the left side there was a loud gallop rhythm at the apex. The blood pressure was equal in both arms, 150/90. When lying down the face was suffused and when erect was essentially normal. The temperature was 98°, the pulse 80. The respirations were 20.

Laboratory examination of the urine was negative. The blood showed a red cell count of 4,700,000, with a hemoglobin of 65 per cent. The white cell count was 9,000, 65 per cent polymorphonuclears. A Hinton test was negative.

X-ray examination showed a large tumor mass occupying the upper mediastinum lying slightly to the right of the midline. It had a sharp slightly lobulated lateral border which projected into the lung field. The mass pulsated. Fluoroscopically the pulsations appeared to be transmitted. The trachea appeared to be narrow above this point. The mass was not well seen in the lateral view. It appeared to lie anterior to the spine. The periphery of the lung fields was clear. The heart shadow was not remarkable. The diaphragm was normal in position, outline and respiratory motion. A re-examination showed the mass to lie anterior to the spine and esophagus, just lateral to the trachea. The barium in the esophagus showed no deformity or displacement.

The day following admission a tracheotomy was performed and a number six tube inserted. On the ninth day he was transferred to the General Hospital. In view of the fluoroscopic findings it was felt that aneurysm seemed unlikely. X-ray treatment was started. This appeared to relieve him somewhat but there was very little change in the size of the mass. He was returned to the Eye and Ear Infirmary after twelve days. At this time swelling of the neck above the tracheotomy tube was noticed. He developed severe dyspnea in spite of the fact that the tracheotomy tube was not obstructed. A longer tube was inserted but the airway was apparently obstructed. He did fairly well for the next five days. The swelling had subsided to a large extent and he was breathing much easier. On the ninth day after his transfer from the General Hospital he had a severe pulmonary hemorrhage which lasted about fifteen minutes and which was partially controlled by suction and morphine. About six hours later he had a second severe hemorrhage and died in about two minutes.

### DIFFERENTIAL DIAGNOSIS

DR. EDWARD D. CHURCHILL: It is interesting that this man had pain with inability to swallow. In carcinoma of the esophagus we see difficulty in swallowing and substernal distress but it is not commonly associated with pain in the early stages. After reading the present illness we begin to think of the possibilities. We have carcinoma in mind and we immediately wonder about a tracheo-esophageal fistula as the cause of the cough associated with eating. The marked tracheal tug is interesting because it is the first time that aneurysm really

comes into the story. Tracheal tug has been classically associated with aneurysm of the arch of the aorta. The paralysis of the larynx was suspected from the change in the voice described in the history.

In reviewing the history of the present illness, the physical examination and the laboratory tests, it seems to me we have very definite evidence of an obstructive lesion in the upper mediastinum which is causing difficulty in swallowing, bilateral abductor paralysis of the cords and venous compression in the upper mediastinum—distended veins and suffusion of the face, particularly in the prone position, and shortness of breath. We look for further information regarding this patient to be brought to light by x-ray studies, the tentative diagnoses being mediastinal tumor, tumor of the esophagus, and aortic aneurysm.

### X-Ray Interpretation

Dr. A. S. MacMillan: The first thing to think of in examining these patients with difficulty in swallowing is, of course, carcinoma because we have found it responsible for about forty per cent of all the cases of difficulty in swallowing in our series of over fifteen hundred cases. Barium was given and there was no intra-esophageal lesion. The barium went down without adhering to the wall. There were no irregularities, but the esophagus was pushed to one side, suggesting mediastinal pressure. In the fluoroscopic examination a mass which definitely pulsated was seen. The rest of the chest was clear. Later a definite enlargement of the mass could be made out, which is against its being an aneurysm, although a pulsating tumor lying anterior to the spine, not involving the esophagus itself, and in the vicinity of the arch of the aorta with bilateral paralysis, is at least suggestive of something connecting with the aorta. External pressure is the cause of about five per cent of all cases of difficulty in swallowing and results from a variety of tumors including aneurysm of the arch of the aorta, mediastinal tumors, tumors of the thyroid, and lesions of the spine itself.

Dr. Churchill: Can you definitely rule out aneurysm?

Dr. MacMillan: We cannot definitely rule out aneurysm of the ascending aorta or some of the great vessels. In every pulsating tumor in the mediastinum we think of aneurysm of course.

### Differential Diagnosis Continued

Dr. Churchill: The diagnosis at this point would seem to rest between a tumor in the upper mediastinum and an aneurysm. Aneurysm of the innominate artery will give a shadow in the upper mediastinum which very closely simulates a plunging goiter or a tumor. The identification of pulsation of a mass by fluoroscopy is difficult. If we have an aneurysm of the popliteal space directly under our fingers, surgeons will differ as to whether the pulsation is expansile or transmitted. I think it is asking too much of the radiologists to expect them to say whether pulsation is expansile, because if the mass moves toward them or away from them with the pulsation it may appear to change in size due to the fact that they are studying a projected shadow. I have taken issue with radiologists once or twice on the habit of stating definitely that pulsation as observed through the fluoroscope is expansile. I think it is a highly questionable finding. I notice that Dr. MacMillan does not commit himself at all on the point.

I think this whole story is more suggestive of tumor than it is of aneurysm, although there are many points of similarity. Tracheal tug is not pathognomonic of aneurysm but I think it is a very suggestive sign when present. It shows that something is closely binding the trachea to the aortic arch, or that the aortic arch is enlarged and directly pulling on the trachea with pulsation. I definitely favor the diagnosis of tumor. It is difficult to go beyond that. We have a range of possibility. Carcinoma starting in the outer coats of the esophagus and spreading anteriorly may be detected with difficulty even by direct esophagoscopy. That is one possibility. We think of substernal goiter, or a malignant change in a substernal goiter. There is no note made as to whether the thyroid gland was palpable. I doubt if it was with the edema and the vein distention. Tumors of the thymus usually appear on the left side and are very rare. The commonest tumor in this site producing these symptoms is a malignant lymphoma. Malignant lymphomas in this region, instead of being the lobulated classical type, are sometimes of the infiltrating type, surrounding the vessels and finally the esophagus in a diffuse mass of tumor tissue. I should give that as the most probable diagnosis although I would not be at all surprised if the growth turned out to be an infiltrating carcinoma of undetermined origin.

With the history of terminal hemorrhage we have to go back again to the story of aneurysm; an aneurysm eroding through the trachea and finally producing death by hemorrhage. Are we dealing with a dissecting aneurysm throughout this entire history? I will stick to the diagnosis of tumor, probably an infiltrating lymphosarcoma or malignant lymphoma.

### Clinical Discussion

Dr. Tracy B. Mallory: We have presented this case as it stood at the time the patient was on the medical wards of the General and have given all the evidence that was available at that time. I am going to ask Dr. Mosher to tell us of his final admission to the Infirmary.

DR. HARRIS P. MOSHER: This patient was on Dr. Smythe's service and I did not see him myself. In our notes the medical service advised against bronchoscopy on account of the pulsating tumor and no bronchoscopy was done during life. An examination was done after death that will be reported by Dr. Ireland.

I should like to speak first about the paralysis of the cord. Dr. Churchill said he made a diagnosis of abductor paralysis on account of the hoarse voice. Usually there is very little if any change in the voice. When we have paralysis of the vocal cord we immediately think of some central cause, or a tumor in the mediastinum. It is fairly common in tabes—and is responsible for the laryngeal crises.

Dr. Ireland was on service when this case came up. He will give his report.

DR. PERCY IRELAND: I do not think we have anything to add from our records except that we definitely had a history of cough with blood-stained sputum, especially in the morning, which was not associated with eating. We did a tracheotomy the day after admission to the Eye and Ear Infirmary and he was discharged nine days later to the General. No bronchoscopy was done at that time. It was discussed and, as Dr. Mosher said, the medical service thought it was not advisable to do one on account of the pulsating tumor. When the patient came back to us three weeks later he had had deep x-ray therapy at the General and had marked edema of the neck. This was felt largely to be due to x-ray reaction and the difficulty in breathing to be due to edema further down in the mucosa of the trachea. In putting a long tube down we met complete obstruction. At that time we wondered if there was something in the trachea. Bronchoscopy was suggested but not done. Six days later he had a terrific hemorrhage. This finally subsided on suction and morphia. About one o'clock in the morning he had another hemorrhage and at that time a bronchoscope was passed through the tracheotomy opening and on sucking it out there was seen an erosion of a pulsating vessel at the anterior surface of the trachea. He died in a minute. That was the only bronchoscopy done, and the biopsy was taken at this time from a mass in the right main bronchus.

DR. CHURCHILL: I did not mention the possibility of this being a carcinoma of the lung in the discussion. Carcinoma of the lung frequently, although by no means invariably, produces bronchial obstruction with attendant atelectasis before causing death. With malignant disease of the superior mediastinum we should, however, mention a tumor arising from the lung and metastasizing early to this region.

DR. MOSHER: Why could it not be one of your half and half tumors?

DR. CHURCHILL: So far as we know they are not so malignant. We have not as yet seen them doing this sort of thing.

### CLINICAL DIAGNOSES

Carcinoma of the lung.
Secondary hemorrhage.

### DR. CHURCHILL'S DIAGNOSES

Mediastinal tumor:
(1) Malignant lymphoma.
(2) Carcinoma.

### ANATOMIC DIAGNOSES

Carcinoma of the right upper lobe of the lung with metastases to the adjacent mediastinal tissue.
Pulmonary hemorrhage.
Pulmonary collapse, right upper lobe.
Operative wound: tracheotomy.
Hydrothorax, right, slight.
Hydropericardium.
Septicemia, streptococcus hemolyticus.

### PATHOLOGIC DISCUSSION

DR. MALLORY: At the autopsy we found upon opening the trachea and bronchi that when we reached the point at which the right primary bronchus divided the upper division suddenly enlarged to the size of the trachea. It was a little over 2 centimeters in diameter; it should have a lumen of only 5 mm. The walls of this enlargement were slightly hard and microscopic sections of them show poorly differentiated epidermoid carcinoma. The carinal glands were not involved, but the glands in the upper mediastinum and the lower portion of the neck contained carcinoma which had begun to escape from the glands and was diffusely infiltrating the deep tissues of the neck, completely surrounding the jugular and subclavian veins on the right and undoubtedly somewhere in that region catching the nerve supply to the larynx. There can be no question I think that we are dealing with a primary carcinoma of the lung which caused no obstruction to the bronchus and consequently no atelectasis; and the symptoms with the exception of the blood-streaked sputum were due to metastases and not the original tumor. The esophagus was not involved although the tumor pressed upon it. An early bronchoscopy would have settled the diagnosis completely. A postmortem blood culture showed hemolytic streptococci, but I believe that the massive terminal hemorrhage was the immediate cause of death.

DR. CHURCHILL: Was it a carcinoma of the azygos lobe?

DR. MALLORY: No; it was definitely in the upper lobe.

A PHYSICIAN: What was the source of the hemorrhage?

DR. MALLORY: The primary tumor was the source of the hemorrhage. The bronchial tree from end to end was completely filled with blood clot.

A PHYSICIAN: Why did he get right abductor paralysis?

DR. MALLORY: The metastases were chiefly on the right side of the neck. The laryngeal nerve could easily have been caught.

A PHYSICIAN: What is a plunging goiter?

DR. CHURCHILL: A substernal goiter. One that has plunged into the mediastinum.

DR. MOSHER: Whose name is that? Is it yours?

DR. CHURCHILL: No. It is a time-honored clinical name.

## CASE 20452

### PRESENTATION OF CASE

*First Admission.* A forty-four year old Austrian tailor entered complaining of cough and chest pain.

Nine months before entry he began to have a slight persistent cough associated with pain in the left chest. At first he believed that it was nothing but a slight cold and kept on working. One month later, however, the cough and pain became worse and were followed by blood-tinged sputum. The amount of sputum was not known. He developed pain in the pit of his stomach which radiated up over the entire left side of the chest and toward the back. The pain was sharp in character, continuous, but varied in intensity. He developed slight dyspnea upon exertion. There was no precordial pain or palpitation. He had no chills but stated that he sweat a great deal both day and night. He continued to work until approximately three months after the onset, when he experienced a sharp pain in the left axilla and precordium which occasionally radiated toward the back. The pain was piercing in character, sudden in onset and not affected by breathing or eating. He entered a hospital where he remained for about seven weeks. He was told he had spots on his lungs and was transferred to a farm for convalescence. He remained there approximately four weeks and then returned to his home. During this period he had lost about twenty pounds in weight. He did not regain his former strength, nor did he resume work. Approximately two months before entry he again began to have blood-tinged sputum.

The family, marital, and past histories were non-contributory.

Physical examination showed a fairly well-developed and nourished man in no distress and coughing only occasionally. His voice was slightly hoarse. His teeth were false. His chest was slightly barrel shaped, with poor expansion. The respirations were shallow. The lungs showed generalized prolonged expiratory sounds with squeaks and groans and a few scattered bronchial râles. Just below the left clavicle was an area of dullness about the size of the palm of the hand over which there was slightly decreased tactile fremitus, increased whispered voice and whispered pectoriloquy, bronchial breathing with loud high-pitched squeaks and occasional medium râles. The heart was enlarged to the left by percussion. The rhythm was regular and the sounds of good quality. The blood pressure was 125/100. The ankle jerks were not obtained. There was a penile scar.

The temperature was 98°, the pulse 80. The respirations were 20.

Examination of the urine was negative. The blood showed a red cell count of 5,320,000 with a hemoglobin of 85 per cent, and a white cell count of 11,500 with 66 per cent polymorphonuclears. The smear was not remarkable. Four examinations of the sputum showed no spirochetes and were all negative for tubercle bacilli. Both Hinton and Wassermann tests were positive. Tuberculin tests of 1:20,000 and 1:1000 were negative after seventy-two hours. A tuberculin test of 1:500 was slightly positive after twenty-four and forty-eight hours.

X-ray examination of the chest showed a triangular area of density projecting outward and upward from the left hilus region. The density was linear in character and quite sharply defined. There were no masses visualized at the lung roots and the periphery of the lung fields was clear. X-ray of the chest taken five months before admission at another hospital was reported to have shown a rather circumscribed area of increased density in the left upper lobe. Another film taken one month later showed a very definite and marked increase in the process. A third film taken two weeks after the second showed a very definite clearing up of the left lobe, leaving a process similar to that seen at the first examination.

Bronchoscopic examination was negative.

He was discharged two weeks after admission to his physician for antiluetic treatment.

*Second admission,* seven months after previous discharge.

*History of Interval.* Antiluetic treatment was begun one month after discharge. In all he received about nineteen intramuscular injections. He also received intravenous treatment. For the first three months he felt well and became much stronger. He did not have any pain, but he did continue to raise blood-tinged sputum. His weight remained unchanged. Three months after discharge, approximately four months before his second admission, he caught cold and developed pain in the precordial and interscapular regions. The pain continued and became almost continuous. The pain was not affected by cough or deep inspiration. His voice began to change and he became hoarse. Three weeks before entry he began to have a dull pain on the right side of the chest along the length of the sternum. This pain was of the same character as that on the left and persisted

until admission. He had grown weaker, felt tired, and lost about twelve pounds in weight. He became dyspneic upon the slightest exertion. His appetite was poor and he had occasional pain in the epigastrium following meals.

Physical examination showed hoarseness and an occasional brassy cough with bloody expectoration. Over the left upper lobe anteriorly the chest showed dullness, bronchial breathing, diminished tactile fremitus, increased spoken and whispered voice and medium râles. Over the left lower lobe posteriorly there was slightly impaired resonance and rather distant breath sounds. There was early clubbing of the fingers. In the left axilla was a large single gland. A few of the inguinal nodes were slightly enlarged.

Examination of the urine was negative. The blood showed a red cell count of 4,800,000 with a hemoglobin of 55 per cent, and a white cell count of 16,850 with 57 per cent polymorphonuclears. Three examinations of sputum showed thick mucopurulent material containing streaks of blood. Examination for acid-fast organisms was negative. The stools were negative. Both Hinton and Wassermann tests were still positive.

X-ray examination of the chest showed the diaphragm on the left side to be definitely higher than on the right. A review of the previous films showed the same condition. The midportion of the left lung field was less radiant than on the previous film. The appearance of the left upper lobe had not changed definitely since the last examination.

Laryngoscopic examination showed paralysis of the left vocal cord.

Bronchoscopic examination on the right was negative except for slight injection of the mucous membrane. The carina was broader than normal and relatively fixed. The bronchi on the left were rather firmly fixed by pressure that seemed to come from without. The left lower bronchus seemed almost entirely obstructed. No outcropping or growth could be seen at any point. There was no bleeding. The whole bronchial tree seemed fixed. The upper lobe bronchus seemed to be flattened and narrowed. No specimen was taken, but an attempt was made to inject the upper lobe of the lung with lipiodol. Under the fluoroscope, air was apparently getting in and out of the upper lobe. The left diaphragm showed a paradoxical movement. On the eighteenth day he had a sudden hemoptysis of thirteen ounces associated with very little coughing. He rapidly failed and died.

## Differential Diagnosis

Dr. J. H. Means: This man also died of sudden hemoptysis, and this story, like Dr. Churchill's case, strongly suggests aneurysm. I suspect that Dr. Mallory has planned the conference with diabolical ingenuity and the question is when is an aneurysm not an aneurysm, or something of that sort.

The history given us is that of a patient with an onset of cough, rather slight, and apparently not productive except for an unknown amount of blood-tinged sputum. The pain in his chest, about which we are told very little, has been apparently of a more or less continuous type, located in the left chest. Pain in the chest and cough with blood-tinged sputum of course suggest tuberculosis first, pulmonary tuberculosis of some sort.

We are told that a sudden episode occurred which I think is of a good deal of interest. In addition to this more or less continuous pain he suddenly gets a sharp pain in the left axilla and precordium which radiates occasionally to his back. We are further told that this was piercing in character, sudden in onset and not affected by either breathing or eating. Therefore it does not sound like pleural pain. It does not sound very much like coronary pain. I cannot give a sound reason for that, but the description does not seem to me to suggest it very strongly. The fact that it was out in the axilla is unusual. To be sure it was over the precordium as well. There is no mention of reference to his abdomen or neck; there is to the back. I think such a sudden pain usually when hooked up with cough and blood-tinged sputum, and the set-up that makes one think of pulmonary tuberculosis, suggests first of all acute pneumothorax. That gives sudden pain which might have these characteristics. I gather that the doctors in charge thought that also, because they gave him treatment appropriate for a tuberculous patient.

We are then told that he lost some weight and his voice was hoarse. With this suggestion of tuberculosis one wonders if he had some laryngeal involvement that would hook up with the picture so far.

His chest was barrel shaped, with poor expansion. Apparently he had some degree of pulmonary emphysema. The signs in the lungs may go with the emphysema and some degree of chronic bronchitis.

We have a very impressive group of physical signs in the left chest in the region of the upper part in front. These signs I should interpret as meaning some sort of solid lesion and I feel that there is very likely some degree of bronchial stenosis. One suspects that a mass is pressing upon the bronchus.

One wonders why the past history is noncontributory. Perhaps the gentleman did not know that he had had a chancre.

I think we can almost rule out the heart as playing any rôle in this attack of pain. If he has had a coronary thrombus it seems as though

there should be more to show than there is. He has a good blood pressure.

We learned from the physical examination that he has a local chest lesion and also emphysema, and that he has had syphilis. The blood examination contributes nothing. The laboratory tests would seem to indicate that tuberculosis was ruled out and syphilis ruled in. One wonders, therefore, whether syphilis plays a rôle in the illness for which he came to this hospital. The easiest way to hook everything together on the basis of syphilis, I think, would be aneurysm. Aneurysms weep sometimes for a long period of time and give blood-tinged sputum. The hoarse voice would go with aneurysm, although it is by no means proof of it. I am not saying at this moment that the story suggests aneurysm, but if syphilis is the etiology I think aneurysm would be the best explanation.

They took x-rays of the chest. I have read the description and seen the films. They are pretty difficult for me to interpret. The diaphragm is a little irregular on one side. The right chest looks bigger than the left. The ribs go out straighter on that side, and the trachea seems to be straight. The interspaces are narrower on the left than on the right. There is a very impressive lesion at the left lung root.

We come to the statement that bronchoscopic examination was negative which brings up the interesting point of the propriety of making a bronchoscopic examination with the facts that they then had. The man had syphilis and a cough with some sputum that was blood-tinged and there was pretty good reason to suspect that he might have aneurysm. I wonder a little how they dared to make a bronchoscopic examination at that time. I suppose they felt that this x-ray showed no evidence of aneurysm and did show evidence of something else. There is a lateral picture which I have a great deal of difficulty in interpreting. There is nothing that I can say is aneurysm. I suppose with the reassurance of the radiologist that the x-ray was not characteristic of aneurysm and was perhaps characteristic of something else they felt it was safe to make a bronchoscopic examination. Anyway they did it, and found nothing. He was discharged two weeks after admission to his physician for antiluetic treatment.

He improved under treatment. I do not know whether that is cause and effect. If the treatment made him better, it suggests that syphilis was at the root of his illness. It may have been chance association. Apparently this lesion, whatever it is, went on weeping blood slightly. I think these things are very suggestive of aneurysm. The kind of pain and the continuous nature of the pain are more consistent with aneurysm than anything else that I know of. The increasing hoarseness of the voice, coupled with this lesion by physical and one by x-ray, suggests that something is going on in the mediastinum which is causing laryngeal paralysis.

He now mentions right-sided pain for the first time. I think one often sees a unilateral chest pain as it gets severe spread to the other side. We see it in angina pectoris not infrequently. I recall a patient with syphilitic heart disease and very severe angina on the left side who had relief on the left side by alcoholic sympathectomy and then proceeded to have pain on the right side. I think in many cases the extent of the spread depends upon the severity of the pain. This spread to the right side may be an expression of increase in intensity of the pain.

The brassy cough is characteristic of aneurysm but may be due to other mediastinal tumors.

There are new things in the second physical examination that are interesting. That axillary gland could be syphilitic. It is large—syphilitic glands are not usually very large—but we do not know how large. The fact that there were glands elsewhere makes one think also of the possibility of neoplasm somewhere with involvement of his axillary glands, as for example in a lymphoma.

The clubbing of the fingers is interesting. I tried to recall the cases of aneurysm I have seen. My impression is that they do not often present clubbed fingers. I think the presence of clubbed fingers would make us think of some other kind of chest lesion than aneurysm.

We have never been told how much sputum he raised. We should like to know if there was any process in the chest with destruction of lung tissue and cavity formation. With a cavity of any kind we would expect a large quantity of sputum.

DR. TRACY B. MALLORY: The only note says that there was a medium amount on eight occasions.

DR. MEANS: Bronchoscopic examination was done again. I do not know just how to visualize the findings. The bronchus was apparently closed by something from outside. The upper lobe seemed to be flattened and narrowed.

He evidently died of a hemorrhage, as much as thirteen ounces of blood, that came on very suddenly, with no cough, which of course again is strongly suspicious of aneurysm. Dr. Churchill's patient coughed up a similar amount and had tumor and not aneurysm, so that this, too, may be derived from a tumor.

I do not think I can make a diagnosis. The x-ray picture does not show aneurysm. I am not certain that it rules it out. It occurs to me that he could have an aneurysm, not a very big one, in the descending aorta, perhaps of an obscure sort, which had burrowed in such

fashion as to reach the lung root and finally erode into the main bronchus or trachea and which had pressed on the lung root and brought about a certain amount of atelectasis of the lung. The picture might be explained in that fashion, but I must confess I think it is questionable whether that is the right interpretation, the chief thing against it being the x-ray examination. The x-ray picture is much more that of a malignant growth in the region of the lung root than aneurysm. On the whole it seems likely, therefore, that he bled from such a neoplasm in the same way that Dr. Churchill's patient did, and died from that cause, the syphilis having nothing to do with it. I cannot believe he had a gumma that caused this picture. It would be extremely unlikely. It would be wiser to guess a tumor, non-syphilitic in origin, than a syphilitic tumor; so that I shall put cancer of the lung first and aneurysm second. That is the best I can do.

### Clinical Discussion

Dr. Frederick T. Lord: This patient was seen in the Thoracic Clinic and there is the additional information that he had wheezing which he had noted when lying on the left side. Also, on physical examination, there were sibilant râles confined to the left side in the front, back and axilla. This is an important indication of a bronchial obstruction.

I agree with Dr. Means's discussion of the diagnosis. It seems to me that syphilis is very unlikely. Syphilis of the respiratory tract almost exclusively involves the trachea and bronchi, and the bronchoscopic examination was negative. A gumma as a cause of such a progressive disturbance seems unlikely. Aneurysm I do not think can be excluded, but I do not see any evidence of aneurysm in the x-ray, or any special suggestion of it in the story. All that is left is the serology. It seems to me in the lateral view the aorta is shown; also a shadow which suggests an atelectasis of the upper lobe. I think the x-ray appearances are consistent with obstruction from without and possibly atelectasis. I should think that tumor was the most likely explanation.

Dr. Edward D. Churchill: I think I know the answer, but I should like to call attention to the two things which perhaps were not stressed. One is the paralysis of the left recurrent nerve and the second is the paralysis of the left phrenic—as evidenced by paradoxical motion of the diaphragm. The paralysis of the left phrenic developed under observation. Both of these are occasional manifestations of this protean disease, carcinoma of the lung. The clubbing of the fingers is, of course, also in favor of carcinoma of the lung. Aneurysm does occasionally give clubbing of the fingers and in fact occasionally gives rise to that very interesting picture of unilateral clubbing of the fingers.

### Clinical Diagnosis

Carcinoma of the lung.

### Dr. Means's Diagnosis

Carcinoma of the lung.

### Anatomic Diagnoses

Epidermoid carcinoma, grade III, of the upper lobe of the left lung with invasion of the pericardium and metastasis to the right adrenal.
Pneumonitis, chronic, with alveolar epithelialization.
Pulmonary emphysema.
Pleuritis, chronic fibrous.
Hemorrhage into bronchial tree and stomach.

### Pathologic Discussion

Dr. Mallory: The autopsy showed an almost identical lesion to that found in the first case, although it was more extensive. The entire left upper lobe was occupied by a massive cavity, nearly six centimeters in diameter, into which the main bronchus of the lobe entered. The wall of that cavity was obviously carcinomatous. The tumor had extended medially through the pleura and the pericardium. Both layers of pericardium had become adherent and at one spot the tumor was actually down to the myocardium although it had not spread into it. It seems as though the precordial pain might well be tied up with the neoplastic invasion of the pericardial sac. In the course of this medial spread the phrenic inevitably was involved and it had spread far enough backward and upward, to catch the laryngeal branch of the vagus.

The one other finding in the case was a very standard one in carcinoma of the lung, a metastasis to the adrenal. My impression is that over sixty per cent of our fatal carcinomas of the lung have shown adrenal metastasis.

Dr. Smith: Were there postmortem evidences of syphilis?

Dr. Mallory: Nothing that we could make out; no changes in the aorta or heart.

Dr. Means: What was the gland in the axilla?

Dr. Mallory: A biopsy was done on the final entry which showed metastatic carcinoma.

Dr. Means: Just what was the situation in the lower lobe?

Dr. Mallory: It was partially atelectatic. The bronchus was collapsed rather than stenosed, though the tumor in the upper lobe may have helped to narrow it by external pressure.

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## THE AWARD OF THE NOBEL PRIZE

THE award of the Nobel Prize to Doctors George Richards Minot, William Parry Murphy, of Boston, and George Hoyt Whipple of Rochester, New York, for their discoveries in the treatment of anemias is gratifying to the medical profession of this country and especially to Boston and Rochester. Although many of our doctors have made notable contributions to scientific medicine, this is the first Nobel Prize to come to doctors of Boston. It is most appropriate because the work of these men has given relief to a large group of sufferers and thereby restored to health and usefulness many persons otherwise doomed to die within a comparatively short time. Moreover, their discoveries have provided the means of treatment and a clue to the nature of anemias distributed widely over the globe.

Because of his own conviction that dietary defects were involved in the cause of pernicious anemia, Doctor Minot was especially prepared to grasp the unanticipated significance for pernicious anemia of Doctor Whipple's fundamental work on hemoglobin regeneration in dogs. He concentrated on the application of dietary measures to the treatment of primary anemia, and in association with Doctor Murphy soon demonstrated the potency of treatment with liver. Not content with the curative power of liver substance in its crude state, in collaboration with Doctor Edwin J. Cohn of the Harvard Medical School, an extract was produced which made possible the treatment of the disease with even more rapid and certain results.

The publication of this work was followed by its general acceptance throughout the civilized world thereby adding greatly to the doctors' armamentarium for the conquest of disease. Today thousands of sufferers with anemia are indebted to these men for their life-saving treatment. The *Journal* wishes to add its congratulations to those already expressed and to state the belief that further honors will come to Boston doctors.

## DOMICILIARY CARE FOR THE NEEDY SICK

FOR years the needy sick of Boston requiring domiciliary care—those unable to attend outpatient clinics and yet not suitable cases for hospitalization—have been cared for by private philanthropy. Of this work the Boston Dispensary and the Massachusetts Memorial Hospitals have borne the brunt, and had they been able to continue the task with no more aid than they have received in the past, there is little question but that the official eyelids would have continued to adhere, one to the other.

The Boston Health League has in its quiet way been aware of the difficulties attendant upon this essential service, and three or four years ago was instrumental in securing an annual grant from a charitable fund which enabled the work to be carried on until the present. Conditions on the whole have not improved, however, and this fall it became apparent that if these visitations were to continue the city must be mindful of its own.

Immediately the opportunity arose for playing the old army game, and a certain amount of buck-passing took place between the departments on whom the duty might with some logic fall. Four possible methods of covering the situation presented themselves: to have the City Hospital assume the obligation, to put it upon The Health Department, to assign it to the Department of Public Welfare, or to have the City enter into contractual relations with the institutions at present carrying on the work.

It has seemed to those most familiar with conditions that this type of medical care was a proper function of neither the Health Department nor the Department of Public Welfare;

the City Hospital has seemed the logical source of such service despite the immediate protest of the trustees, and despite the argument that the possibilities of political interference are great. This, of course, must be a matter of general acknowledgment. On the other hand it is conceded that there is danger in establishing the precedent of allowing the City to buy service from private agencies.

In order to discuss the question and if possible settle the matter, Mayor Mansfield met on October 22 with a group of twenty-five authorities representing the Department of Public Welfare, the City Hospital, the Massachusetts Memorial Hospitals, the Boston Dispensary, the Boston Health League, the Health Department, the Boston Council of Social Agencies and the Boston University School of Medicine.

Fortunately what seemed to be the soundest viewpoints prevailed and it was decided that the City Hospital should assume the duties as soon as possible, the dispensaries continuing until that time.

## THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

HUNT, ERNEST L. M.D. Harvard University Medical School 1902. F.A.C.S. Formerly, Director, Division of Surgery, Worcester City Hospital. Now: Surgeon-in-Chief, Fairlawn Hospital. Consulting Surgeon, Worcester County Sanitarium, Worcester State, Worcester City, U. S. Veterans No. 89, and Harrington Memorial Hospitals. His subject is "Cancer of the Lower Colon (Sigmoid) and Rectum." Page 849. Address: 28 Pleasant Street, Worcester, Massachusetts.

BERLIN, DAVID D. M.D. Tufts College Medical School 1923. F.A.C.S. Instructor in Surgery, and Assistant Professor in Anatomy, Tufts College Medical School. Assistant to Visiting Surgeons, Boston City Hospital. Surgeon, Out-Patient Department and Thyroid Clinic, Beth Israel Hospital. Address: 68 Bay State Road, Boston, Massachusetts. Associated with him are

BLUMGART, H. L. B.S., M.D. Harvard University Medical School 1921. Visiting Physician, Beth Israel Hospital. Associate Professor of Medicine, Harvard Medical School. Director of Medical Research, Beth Israel Hospital. Address: 330 Brookline Avenue, Boston, Massachusetts. And

WEINSTEIN, A. A. A.B., M.D. Harvard University Medical School 1933. Former Assistant Resident, Medical Research, Beth Israel Hospital. Now, Intern in Medicine, Beth Israel Hospital. Address: Beth Israel Hospital, Boston, Massachusetts. And

RISEMAN, J. E. F. B.S., M.D. Harvard University Medical School 1929. Assistant in Medicine, Beth Israel Hospital and Harvard Medical School. Address: 311 Commonwealth Avenue, Boston, Massachusetts. And

DAVIS, DAVID. B.S., M.D. Cornell University Medical College 1925. Assistant in Medicine, Beth Israel Hospital, and Harvard Medical School. Address: 485 Commonwealth Avenue, Boston, Massachusetts. Their subject is "Treatment of Angina Pectoris and Congestive Failure by Total Ablation of the Normal Thyroid Gland." Page 863.

BUMPUS, HERMON C., JR. M.S., M.D. Harvard University Medical School 1915. F.A.C.S. Associate Professor, Mayo Foundation, University of Minnesota Medical School. Formerly Member of Staff, Mayo Clinic, Rochester, Minn. His subject is "Transurethral Prostatic Resection." Page 871. Address: Pasadena, Calif.

MURRAY, CLAY RAY. M.D. Columbia University College of Physicians and Surgeons 1912. F.A.C.S. Assistant Professor of Surgery, Columbia University College of Physicians and Surgeons. Associate Attending Surgeon, Presbyterian Hospital, New York. His subject is "The Treatment of Fractures About the Ankle Joint." Page 878. Address: 620 West 168th Street, New York City.

## CORRESPONDENCE

### ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,
October 29, 1934.

*Managing Editor,*
The *New England Journal of Medicine,*

In addition to the articles enumerated in our letter of September 29 the following have been accepted:

Bilhuber-Knoll Corporation
Dilaudid Rectal Suppositories 1/24 grain

Grisard Laboratories
Scillonin
Tablets Scillonin, 0.5 mg.
Solution Scillonin

Mallinckrodt Chemical Works
Phenobarbital Sodium

Parke, Davis & Co.
Diphtheria Toxoid, Alum Precipitated (Refined) —P. D. & Co.

E. R. Squibb & Sons
Sterile Ampules Procaine Hydrochloride—Squibb (Crystals) for Spinal Anesthesia, 50 mg.

Sterile Ampules Procaine Hydrochloride—Squibb (Crystals) for Spinal Anesthesia, 100 mg.

Sterile Ampules Procaine Hydrochloride—Squibb (Crystals) for Spinal Anesthesia, 120 mg.

Sterile Ampules Procaine Hydrochloride—Squibb (Crystals) for Spinal Anesthesia, 150 mg.

Sterile Ampules Procaine Hydrochloride—Squibb (Crystals) for Spinal Anesthesia, 200 mg.

Supplee-Wills-Jones Milk Co.
Supplee B. Acidophilus Milk

Yours very truly,

PAUL NICHOLAS LEECH, *Secretary*,
Council on Pharmacy and Chemistry.

## RECENT DEATHS

**KEPLER** — CHARLES OBER KEPLER, M.D., of 49 Englewood Avenue, Brighton, died November 1, 1934. Dr. Kepler was born at Burbank, Ohio, in 1868, the son of William and Anna (Ober) Kepler. After a preparatory education at Baldwin University at Berea, Ohio, where he was given A.B. and A.M. degrees, he graduated in medicine from the Harvard Medical School in 1899. He subsequently studied in Vienna and conducted a practice with offices at 360 Commonwealth Avenue, Boston, until disabled by illness four years ago.

Dr. Kepler served as Captain in the Medical Officers Reserve Corps and was assigned to Camp Devens.

He was a Fellow of the Massachusetts Medical Society having joined in 1900 and was also a Fellow of the American Medical Association. He was a 32d degree Mason.

He is survived by his widow, Mrs. Effie A. (Sweet) Kepler, and three daughters, Aura Elizabeth, Helen, and Edith Katharine Kepler.

**DAY**—EDWARD PHILIP DAY, M.D., of 385 Columbia Road, Dorchester, Mass., died October 31, 1934, following a long illness.

Dr. Day was born in St. Johnsbury, Vermont, and graduated in medicine from the Bowdoin Medical School in 1898. He joined the Massachusetts Medical Society in 1916, and practiced in Albion, Maine, for fourteen years before coming to Boston. He was a member of the Maine Medical Association and the Norfolk District Medical Society. He is survived by his widow, Mrs. Jennie (Bowers) Day; a daughter, Mrs. Wilbur H. Whitty of Dorchester, and a son, John R. Day, also of Dorchester.

## NOTICES

### The Massachusetts Medical Society

SECOND ANNUAL POSTGRADUATE MEDICAL EXTENSION COURSE

The following sessions have been arranged by the Committee:

Barnstable

Sunday, November 11, at 4:00 P.M., at the Cape Cod Hospital, Hyannis. Subject: Dermatology and Syphilis. John I. B. Vail, M.D., Chairman.

Berkshire

Thursday, November 15, at 4:30 P.M., at the House of Mercy Hospital, Pittsfield. Subject: Surgery (Third Session). Albert C. England, M.D., George S. Reynolds, M.D., Chairmen.

Bristol North (Taunton Section)

Wednesday, November 14, at 7:30 P.M., at the Morton Hospital, Taunton. Subject: Surgery (Second Session). Arthur R. Crandell, M.D., Chairman.

Bristol South* (Fall River Section)

Monday, November 19, at 4:00 P.M., at the Stevens Clinic of the Union Hospital, Prospect Street, Fall River. Subject: Cardiovascular Disease (Third Session). Eugene A. McCarthy, M.D., Sub-Chairman.

Essex North

Tuesday, November 13, at 4:00 P.M., at the Hotel Bartlett, 95 Main Street, Haverhill. Subject: Cardiovascular Disease (First Session). Francis W. Anthony, M.D., Chairman.

Essex South

Tuesday, November 13, at 4:00 P.M., at the Salem Hospital, Salem. Subject: Endocrinology (First Session). Walter G. Phippen, M.D., Chairman.

Franklin

Wednesday, November 14, at 8:00 P.M., at the Franklin County Public Hospital, Greenfield. Subject: Surgery (First Session). Halbert G. Stetson, M.D., Chairman.

Hampden

Thursday, November 15, at 4:00 P.M., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8:00 P.M., at the Holyoke City Hospital, Holyoke. Subject: Surgery (First Session). George L. Schadt, M.D., Chairman.

Hampshire

Wednesday, November 21, at 4:15 P.M., in the Nurses' Home of the Cooley Dickinson Hospital, Northampton. Subject: Pediatrics (Third Session). Robert B. Brigham, M.D., Chairman.

*No session on November 12 (Armistice Day).

Middlesex North

Friday, November 16, at 7:00 P.M., at the St. John's Hospital, Lowell. Subject: Surgery (Third Session). Frederick P. Murphy, M.D., Chairman.

Middlesex South*

Wednesday, November 14, at 4:30 P.M., at the Cambridge Hospital, Mt. Auburn Street, Cambridge. Subject: Obstetrics and Gynecology (First Session). Charles E. Mongan, M.D., Chairman.

Norfolk

Friday, November 16, at 8:30 P.M., at the Norwood Hospital, Norwood. Subject: Surgery (Third Session). Hugo B. C. Riemer, M.D., Chairman.

Tuesday, November 13, at 4:00 P.M., at the Faulkner Hospital, Jamaica Plain. Subject: Cardiovascular Disease (Second Session).

Norfolk South

Monday, November 12, at 8:30 P.M., at the Quincy City Hospital, Quincy. Subject: Pediatrics (First Session). David L. Belding, M.D., Chairman.

Plymouth

Tuesday, November 13, at 4:00 P.M., at the Brockton Hospital, Brockton. Subject: Obstetrics and Gynecology (Second Session). Walter H. Pulsifer, M.D., Chairman.

Worcester

Wednesday, November 21, at 7:30 P.M in the Auditorium of the Nurses' Home of the Memorial Hospital, Worcester. Subject: Surgery (Second Session). Erwin C. Miller, M.D., Chairman.

Worcester North (Ayer Section)

Thursday, November 15, at 8:00 P.M., at the Ayer Community Memorial Hospital, Ayer. Subject: Pediatrics (Third Session). Frank S. Bukeley, M.D., Chairman.

Worcester North (Fitchburg Section)

Friday, November 16, at 4:30 P.M., at the Burbank Hospital, Fitchburg. Subject: Obstetrics and Gynecology (Third Session). Edward A. Adams, M.D., Chairman.

*No session on November 12 (Armistice Day).

## CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

At 3:30 P.M. on Thursday, November 15, in the Amphitheatre of the Peter Bent Brigham Hospital Dr. Henry A. Christian, Physician-in-Chief, Hersey Professor of the Theory and Practice of Physic in the Harvard Medical School, will give a medical clinic. To it are cordially invited practitioners and medical students. These clinics will be repeated on Thursdays until May.

On Saturdays in the wards of the Peter Bent Brigham Hospital, from 10 to 12, staff rounds will be conducted by Dr. Christian. These are open to all physicians.

## ANNOUNCEMENT

Dr. William B. Terhune, formerly with the Riggs Foundation in Stockbridge, Massachusetts, announces the opening of his office at Silver Hill, Valley Road, New Canaan, Connecticut.

## UNITED STATES CIVIL SERVICE EXAMINATION

### Junior Parasitologist

Applications for the position of Junior Parasitologist, Bureau of Animal Industry, Department of Agriculture, must be on file with the U. S. Civil Service Commission at Washington, D. C., not later than November 26, 1934.

At present there is a vacancy in the Bureau of Animal Industry with headquarters at Beltsville, Md. The Department of Agriculture wishes to fill this position with a woman eligible. Both men and women, who are qualified, will be admitted to the examination.

The entrance salary is $2,000 a year, subject to a deduction of not to exceed 5 per cent during the fiscal year ending June 30, 1935, and also to a deduction of 3½ per cent toward a retirement annuity.

The duties are to conduct research in the field of animal parasitology.

Full information may be obtained from the Secretary of the United States Civil Service Board of examiners at the post office or customhouse in any city which has a post office of the first or the second class, or from the United States Civil Service Commission, Washington, D. C.

## POSTGRADUATE CLINIC DAY

Greater Boston Medical Society at Beth Israel Hospital, Wednesday, November 14, 1934

A.M. Medical:

Exhibits (Ward Visiting Room):

Pathology: Dr. M. J. Schlesinger.

X-Ray: Drs. S. A. Robins, H. Friedman, and W. S. Altman.

Anaphylaxis: Dr. A. Colmes.

Pneumothorax: Drs. M. Joress and M. H. Stone.

Gastro-Intestinal: Drs. I. R. Jankelsohn and B. Banks.

Blood: Dr. William Dameshek.

Fungi: Dr. Jacob Swartz.
Dr. M. L. Brodny.

Medical Research: Dr. H. Blumgart and Associates.

Heredity in Diabetes: Dr. A. Rudy.

Medical Ward Rounds (Wards 4C and 5E): Dr. Harry Linenthal. 10:00-12:00.

Medical O. P. D. Clinics and Special Clinics:

Gastro-Intestinal: Dr. Jankelsohn and Staff.

Cardiac: Dr. Wolff and Staff.
Anaphylaxis: Dr. Colmes and Staff.
Neurology: Dr. Loman.

A.M. Surgical:

Ward Rounds: Dr. M. Barron and Staff — 9:00-10:30.

Operations: Dr. M. Barron and Staff — 10:30-12:00.

Urological Dry Clinic (Venerology): Auditorium —10:30-12:00.

Luncheon — 12:30-1:30. (Don't fail to see the exhibits.)

P.M. Clinico-Pathological X-Ray Conference and Discussion:

A. Case 1. Carcinoma of Thyroid Gland—Metastases — Chylous Hydrothorax and Ascites: Discussion participated in by Dr. S. A. Gargill, Dr. S. A. Robins, Dr. M. J. Schlesinger.

Case 2. Diarrhea — Anemia—Neurological Symptoms — Regional Ileitis—Operation —Death. Discussion participated in by Dr. William Dameshek, Dr. Julius Loman, Dr. M. J. Barron, Dr. S. A. Robins, Dr. M. J. Schlesinger.

Case 3. Diabetes Insipidus—Exophthalmos —Cranial Defects—Non-union of Fractures — X-Ray Treatment. Discussion participated in by Dr. H. L. Blumgart, Dr. William Dameshek, Dr. M. J. Schlesinger, Dr. Harry Friedman.

B. Newer Diagnostic Methods by Roentgen Ray: Dr. S. A. Robins.

C. Short Diagnostic Problems:
1. Pentosuria Masquerading as Diabetes Mellitus: Dr. A. Rudy.
2. Cough Due to Foreign Body of Lung: Dr. L. M. Friedman.
3. Radiculitis Masquerading as Angina Pectoris: Dr. Louis Wolff, Dr. Julius Loman, Dr. S. S. Hanflig.

## REPORTS AND NOTICES OF MEETINGS

### THE NEW ENGLAND ROENTGEN RAY SOCIETY

The October meeting of the New England Roentgen Ray Society was held at the Boston Medical Library on October 26, 1934. The meeting was opened by Dr. Healy, who, after the preliminary formalities, introduced Dr. Channing C. Simmons as the speaker of the evening.

Dr. Simmons opened his discussion on tumors of bone by pointing out the absolute necessity of an x-ray examination in the diagnosis of bone tumors. With the exception of the adamantinomas of the jaw, all bone tumors are mesoblastic in origin. The more differentiated the fibroblastic cells are, the less malignant the tumor is. A modified form of Ewing's classification of bone tumors was presented, and each type considered briefly.

Osteogenic sarcomas appear in young adults under the age of twenty almost exclusively, and with very rare exceptions never occur after the age of fifty, unless they are the result of the degeneration of Paget's disease. These tumors are located usually at the ends of the long bones, as contrasted with the central position of Ewing's tumors. The common symptom is pain referred to the adjacent joint, and there is rarely any temperature or limitation of motion. There is often a history of preceding trauma. A series of cases was then presented with the x-ray pictures and photographs of the actual tumor to show the chief histologic characteristics. The tumor is both periosteal and central, the destruction occurring centrally with bone formation outside. There are two types of osteogenic sarcoma, the osteolytic where the pathological picture is chiefly destructive, and the osteoblastic where there is mostly new bone formation. Phosphatase, an enzyme found where there is new bone activity, is markedly increased in both these types, but especially in the osteoblastic type. This is of value in the differential diagnosis and in finding early metastases. The treatment depends chiefly on early surgical removal, and whether there is any advantage to preoperative radiation has not yet been determined. It is Dr. Simmons' practice to secure a biopsy with a tourniquet applied, and then to operate if the biopsy proves positive. It is at least partially due to the fact that these tumors are not seen by the surgeon until relatively late that its treatment has had such poor results. Not only are physicians prone to wait until it is too late, but parents are often unwilling to allow amputation; so that often three to eight months pass before the patient comes to surgery.

Ewing's tumor is as common as the osteogenic type, is preceded by trauma, and has a clinical picture, which is all too easily confused with osteomyelitis. There are pain, tenderness, redness, and leucocytosis; and the temperature is often as high as one hundred and one degrees. The pathologic picture consists almost entirely of bone destruction, but in some cases there may be a marked reactive bone formation around the outside. This tumor grows somewhat more slowly than the osteogenic type, its average duration being three and one-half years; its location is usually in the center of the shaft, and the phosphatase level is low.

In multiple myeloma there is pain and bone destruction. The tumor is chiefly composed of plasma cells and is radioresistant. Commonly all the bones are involved, but occasionally there is only one. It has been Dr. Simmons' experience that the Bence-Jones protein is found in only a few cases.

In giant-cell tumors there is only bone destruction with a ballooning out of the periosteum and a trabeculation well seen in the x-ray picture. This type of tumor occurs more in older people, and may

be treated by x-ray, resection, or curetting. Sixty per cent are said to be cured by curetting and seventy per cent by x-radiation, but in view of the fact that sometimes these tumors go on to malignant degeneration, it is usually better to excise them, although x-ray is used if they are in a position where surgery would cause marked impairment of the function of the extremity.

Syphilis is confusing in that it may be indistinguishable from osteogenic sarcoma. The Wassermann reaction is negative in forty per cent of bone lues, but the Hinton is more often positive. Adamantinomas come from the epithelial, enamel-forming part of the tooth, and if not well differentiated may be very malignant. It is treated by bone resection.

After the lecture there was a brief discussion in which it was pointed out that there is a history of bone injury in forty per cent of the cases of osteogenic sarcoma, and Dr. Simmons believes that there is some relationship. There should be no confusion between acute osteomyelitis and bone tumors, because there is no x-ray change in the former condition. At the Boston City Hospital it is the practice never to radiate giant-cell tumors that have been interfered with. The question of the use of Coley serum in the treatment of bone tumors was considered, but there have never been any cures from this treatment alone and Dr. Simmons does not use it.

## PHYSICIANS' ART SOCIETY

The Annual meeting of the Physicians' Art Society of Boston was held at the Boston Medical Library on Monday evening, October 29.

The following officers were elected for the ensuing year:

President: Dr. J. Dellinger Barney.

Vice-President: Dr. Lewis W. Hill.

Secretary-Treasurer: Mr. James F. Ballard.

Executive Committee: Dr. William W. Harvey and Dr. Fritz B. Talbot.

The Secretary's report outlined the history of the Society from its beginning in April, 1933, when a committee of Drs. Barney, Binney, Cotton, Mosher and Wiggin first met to consider the organization of the Association. The Society was organized in February, 1934, at a special meeting, at which time the Constitution and By-Laws were adopted. Dr. Barney was elected President and James F. Ballard, Secretary-Treasurer, to hold office until the first Annual Meeting.

The object of the Society is to foster arts and crafts among members of the allied professions and hold exhibits of the work of its members. Membership in the Society is open to all members of recognized medical and dental societies and other allied organizations, including hospital internes and medical students. The annual dues are $2 a year and do not include entry fees for exhibits.

The Society held its first exhibit in April, 1934, and it was very successful, as thirty-one physicians and dentists exhibited some 129 items, and more than 700 persons viewed the exhibition during the two weeks it was open. A committee of artists and critics, consisting of well-known men of Boston, judged the various classes and made a first award to Dr. James C. Janney for the best oil; Dr. William W. Harvey for the best water-color; Dr. J. Dellinger Barney for the best pencil drawing; and, Professor W. B. Cannon for the best sculpture.

During the Convention of the American College of Surgeons, a selection of one hundred items from the April exhibition was shown in the Boston Medical Library and attracted considerable attention.

The exhibits were made self-supporting and there is a small balance on hand for general expenses.

Dr. Barney spoke briefly about the Society, following which Mr. C. Howard Walker gave a very interesting address on art in general and especially in relation to the medical profession.

## THE WILLIAM HARVEY SOCIETY

The last meeting of the William Harvey Society was held on the seventeenth of October in the Beth Israel auditorium.

After a brief introduction by Dr. Good, Dr. Emil Novak of Baltimore, the guest speaker, began his lecture on the relation of the endocrines to gynecology. He took for his particular topic menstruation and pointed out that much has been learned in the past twenty-five years regarding this phenomenon.

It was the old idea in ancient history that menstruation was a cleansing process and it was known by the Greek word "catharsis". Even to this day menstruating women are segregated in many places in Africa, because it is believed that they have an evil influence on those who come in contact with them. It has lately been shown that menstruation does cause certain chemical changes in the secretions of the skin which are harmful to growth. The older theories of the medical men have been chiefly: first, the theory of Galen that all women have too much blood and naturally bleed once a month; secondly, Damocrates believed that women's blood had a ferment which boiled over periodically; and thirdly, that the moon caused menstruation (based on the fact that the menstrual cycle is the same as that of the moon).

In the last century the ovary was connected with this phenomenon for the first time, it being thought that the ovarian influence was exerted through nerve connections. It was not until 1896 that this theory was disproved, and the influence of the ovary shown to be blood borne. In 1903, the importance of the corpus luteum in pregnancy and menstruation in animals was shown, and for many years was applied too rigidly to the human cycle. In 1908, it was discovered that the endometrium is constantly changing during the cycle, and a correla-

tion was made between the ovarian and endometrial cycles. The Graafian follicle starts to mature at the beginning of the cycle, increasing in size until about the thirteenth or fourteenth day, dating from the first day of bleeding, ruptures, and extrudes the egg which slowly passes down the tube to the uterus. In the shell left by the follicle the corpus luteum develops, containing the pigment carotin.

As the follicle develops, it gives off an increasing amount of folliculin, also known as estrin or theelin. This hormone increases the size of the epithelial cells and lengthens the glands of the endometrium, which become more vascular. Ovulation is followed by the formation of the corpus luteum which continues to produce estrin, and in addition, another hormone called progestin, which causes the glands of the endometrium to secrete. Progestin prepares the endometrium for the implantation of the ovum, in case it is fertilized. If fertilization takes place, the corpus luteum gets larger; otherwise it degenerates at the time of menstruation.

Fertilization takes place at, or near, the time of ovulation, from the twelfth to fifteenth day. It is probable that the egg does not live over twenty-four hours, while the spermatozoa live not over three days. There is good evidence that for the rest of the cycle pregnancy cannot take place, this idea being known as biological contraception.

Dr. Novak then went on to point out the importance of the pituitary body, particularly the anterior lobe, in menstruation, calling it "the power behind the throne". It is the fundamental gland causing menstruation, and its removal immediately stops the cycle. It does not have any effect on the endometrium, but only on the ovary, which in turn affects the endometrium. The hormone from the anterior pituitary body is collectively known as prolan, and is believed by many to be the principle present in the urine of pregnant women, although others believe it to be formed by the chorionic tissues. Prolan has two chief effects: first, the ripening of the follicle, this factor being called prolan A, and secondly, the luteinization and formation of progestin by prolan B. Whether these two factors are separate or simply different phases of the same hormone is, as yet, not settled.

The pituitary also controls the production of milk after the breast has been primed by the ovarian hormones, and it is probable that other glands are involved in both menstruation and pregnancy. Dr. Novak did not take up in detail the abnormalities of menstruation, but pointed out that it is important to study the woman as a whole, and not to try to formulate some cure-all, be it hormonal or otherwise, for any one dysfunction.

## THE BOSTON BIOLOGICAL SOCIETY

A meeting of the Boston Biological Society was held in the new Biological Building on Divinity Avenue in Cambridge on the evening of October 24, 1934. The meeting was called to order by Dr. Wislocki who introduced Dr. Clifford C. Franseen as the first speaker of the evening.

Dr. Franseen spoke on "Phosphatase in Tumors of Bone." Phosphatase is an enzyme which is secreted by osteoblasts and which causes a local increase of the phosphate ions in the zone of ossification. He reported his work done at the Huntington Memorial Hospital on the study of the phosphatase content, not only in the blood plasma of cases of various bone tumors, but also the content in the actual bone tumor tissue. The amount of this enzyme present varies directly with the amount of osteogenesis. By the methods used the normal values in blood plasma are between 0.12 and 0.25 units per cubic centimeter. In normal tissue the normal values vary up to as high as 0.52 units per gram of tissue.

In osteochondroma, a benign tumor, the tissue phosphatase may be very slightly increased, while the plasma is normal. In myeloma and Ewing's tumor there is practically no phosphatase present in the tissue, the plasma being normal, although it may be slightly elevated in Ewing's tumor. Both the tissue and plasma phosphatase in giant-cell tumors are slightly elevated or normal. The osteolytic type of osteogenic sarcoma shows a moderate rise in both tissue and plasma, while in the osteoblastic type both tissue and plasma are very markedly increased in their phosphatase content, the tissue rising as high as two hundred and nine units per gram, and the plasma to 4.8 units per cubic centimeter. A comparison of these figures shows that while several of these tumors may overlap in their plasma phosphatase contents, the osteoblastic type of osteogenic sarcoma is distinctly above any of the others. Also the tissue of phosphatase of this tumor is so high that it does not overlap with any other group. The osteolytic type does overlap the giant-cell type. Operative removal of these sarcomas causes immediate drop in the plasma phosphatase, and metastases may be recognized by the subsequent increase. The clinical use of the above data is chiefly concerned with the early diagnosis of the osteoblastic type of osteogenic sarcoma before there is sufficient characteristic change for the pathologist to recognize, and in the follow-up postoperatively.

The second speaker of the evening was Dr. Friedgood who reported some very interesting experiments done on one hundred and sixty-five guinea-pigs which caused a syndrome similar to Graves' disease in human beings. Daily alkaline extracts of the anterior pituitary gland in amounts of two cubic centimeters per kilogram of body weight were injected intraperitoneally. Within eighteen hours the basal metabolic rate rose rapidly to from plus ten to plus forty per cent, and continued to increase to a maximum peak on the eighth day which was as high as plus sixty-six per cent. After this initial increase there was a spontaneous remission to normal or below, which lasted from one to three weeks. In long-continued injections there were often cycles

of remissions and recurrences of hyperthyroidism. In general, the males responded more in the low range, while the females responded more to a high range of basal metabolic rates. This result is in keeping with clinical findings in human beings.

The rise in basal metabolic rate was accompanied by a fall of iodine in the gland and a rise of iodine in the blood. The colloid became vacuolated and thinned out, there being a hyperplasia of the cellular elements of the thyroid gland. When the basal metabolic rate fell there was an accompanying change in the histological picture of the gland until the cells became resting in type.

The nature of these remissions is a mystery. Dr. Friedgood studied the effect of iodine during the remission and found that the basal metabolic rate dropped within three or four days to a myxedematous level, and then slowly returned within a week to its original low value. If thyroid extract is given during these remissions, there is a tremendous rise in the basal metabolic rate, and if iodine is given before the injection of anterior pituitary extract, the typical rise in basal metabolic rate is inhibited. The inhibition of the basal metabolic rate is immediate, if the iodine is given in large doses, while very small doses may sometimes cause a higher level of basal metabolic rate when given with the thyrotrophic hormone of the anterior pituitary.

Therefore, it would seem from these experiments that the thyroid is limited in its response to stimulation; that the anterior pituitary causes changes in the thyroid which are similar to those found in hyperthyroidism in man; that the clinical course is the same in guinea-pigs and man, there being chronic cases in human beings of remissions and exacerbations. In consideration of exophthalmos, it is interesting to note that the anterior pituitary extract can produce this change in the absence of a thyroid gland, which indicates the independence of this sign of thyroid activity. In the above experiments it tended to come usually in the hypothyroid state during the remission.

In the discussion of the paper Dr. Means pointed out that clinically the action of iodine seems to be continual instead of remitting, as is suggested by the above experiments.

Dr. T. J. B. Steer, as the last speaker of the evening, discussed the reliability of the excised preparation of the heart for experimental purposes. He pointed out that the rate of the ventricle falls, particularly in the first three hours, to a level seventy per cent lower than the initial rate. He studied the effect of temperature on the heart muscle at different times after its excision, in order to find a region of relative stability. In the frog's heart he found that it was necessary to wait twenty hours before a plateau, such as might be used as a base line, was established. The preparation is more reliable when perfused. In the spring the low rate is maintained for a much longer period than in the autumn when it tends to rise again.

## THE AMERICAN COLLEGE OF SURGEONS

The presidential meeting of the twenty-fourth annual clinical congress of the American College of Surgeons was held in Symphony Hall on the evening of October 15. It was opened by the introduction of many notable foreign guests. Dr. Arthur W. Allen, chairman of the Boston Committee on Arrangements, delivered a short address in which he welcomed the members and their guests to Boston.

Dr. William D. Haggard of Nashville, retiring president, delivered a short address on the background of the American surgeon, in which he reviewed medical history. He pointed out that surgery has a noble heritage, its disciples being the descendants of many great minds in the past. He listed the names of the great medical men in the world and of America down through the ages.

Following Dr. Haggard, Dr. Robert B. Greenough of Boston was inaugurated as the new president of the College. He delivered his inaugural address on "Efficient Surgical Service for the Whole Community*."

The meeting was closed by Dr. Donald C. Balfour of Rochester, who delivered the John B. Murphy oration on "Principles of Gastric Surgery." He summed up the history of gastric surgery, pointing out the landmarks of progress. The stomach and the first part of the duodenum are especially liable to chronic disease because: first, we tend to abuse them; and secondly, their development is more recent embryologically, and, therefore, they are not so immune as other portions of the body. The establishment of technique whereby sutures can be used safely in the stomach has made it possible to cure a definite percentage of cancer, acute perforations, and other conditions requiring surgical incisions.

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The last meeting of the American College of Surgeons was held in Symphony Hall on the evening of October 17, 1934. After the officers, regents, honorary guests, and the candidates for fellowship in the College had filed in, the meeting was opened with a prayer offered by the Reverend Charles Wesley Burns, Bishop of the Methodist Episcopal Church. Franklin H. Martin, Director-General, then presented the candidates for fellowship to the President. These candidates numbered 595, including four from Porto Rico, three from Nova Scotia, six from Canada, two from China, one from each of England, Turkey, Syria, and the Bahamas, and two from India. After these surgeons from several parts of the world had repeated the pledge, they were given fellowships by President Greenough. Honorary fellowships were conferred on Sir Harold Gillies of London, Professor Josef Halban of Vienna, Mr. Harry Platt of Manchester, England, and Dr. Bethel Solomons of Dublin, Ireland.

President Greenough addressed the assembly on

*A digest was published in this *Journal* on page 788, issue of October 25, 1934.

the subject of "Special Cancer Clinics." The College of Surgeons for the past four years has recommended the establishment of special clinics in general hospitals for the study and treatment of cancer, and Dr. Greenough discussed the advantages and disadvantages of this system, as seen after a four years' trial. He urged that Cancer Institutes and Cancer Hospitals be supported, and stressed the continued need for the support of research in this field.

There are two forms of cancer clinics in general hospitals; first, those that are merely diagnostic, and secondly, those that both diagnose and treat cancer patients. These clinics have a relatively low maintenance cost and their standards are kept high through the use of the group system for the study of cancer patients advocated by the American College of Surgeons.

The first advantage of these clinics is that the patient with cancer is more completely studied. In discussing this point Dr. Greenough said that there is certainly much more accurate diagnosis, remote metastases often being discovered that ordinarily would never be recognized, thus avoiding the strain that a useless operation would put on the patient. The coöperation of the surgeon, roentgenologist, and pathologist is procured, and individual jealousy and prejudice is largely overcome. Early diagnosis of cancer is made possible through the greater experience of the men in the clinics and through the proper use of frozen sections during exploratory operations. The real test of the use of these clinics is seen in the attitude of the physician and patient, there being a steady increase in the attendance everywhere.

Secondly, better and more uniform records are kept in which details of history, physical examination, pathology, and treatment are carefully written up on special cards supplied by the College for this purpose. Such a recording system makes possible a more detailed classification and analysis of cases and the results of treatments.

Thirdly, the clinic system makes possible a systematic follow-up so that long-time and end-result studies may be made. This is very essential, and it is seldom that the patient breaks his appointment. It is hoped that this part of the program will be more universally adopted than has been the case thus far.

Fourthly, the cancer material is concentrated into a small group giving valuable experience to medical men interested in this field, and offering more expert service to the patient. A certain amount of rotation of the surgeons of the staff who are interested in tumor surgery is advisable. Free discussion between surgeons, pathologists, x-ray men, and students is forwarded. The local physicians are invited to come with their patients, thus giving them the opportunity of learning also.

Furthermore, postgraduate and undergraduate cancer instruction is made both easier and more efficient, and a good, inexpensive service for the diagnosis of early cancer is offered both patient and physician.

The principal disadvantage of the system is that the segregation of cancer patients tends to restrict cancer treatment to a limited group of specialists and diminishes the interest of other members of the profession. Dr. Greenough freely admitted this, but pointed out that the specialist "has come to stay" and that no man can be master of all trades. The supposed disadvantage that the term *cancer* creates despair in the patient is becoming less real year by year, as the layman comes to realize the possibilities of early treatment. Many clinics prefer the use of the term "Tumor Clinic." The American College of Surgeons will continue to reaffirm its cancer policy and urge the furtherance of these clinics.

Following Dr. Greenough's discussion, Lotus D. Coffman, President of the University of Minnesota, spoke briefly on "Medicine and Public Service." He emphasized the fact that civilization pays for what it does not have as well as for what it has. The contributions to medicine in the past sixty years have been manifold and depend on the attitude that people take toward this science. The surest way for a doctor to become recognized is to become a better doctor by mastering new knowledge in his field. There are not too many doctors, for each time the cultural level of a community is raised, the needs of that community are increased, and it is our duty to raise the level to such a point that all the doctors will be needed. In discussing social medicine, Dr. Coffman stressed the point that physicians must be willing to change their methods if and when such changes mean more service. The physician "achieves to serve and serves to achieve" and the true professional man will always put common service ahead of personal gain.

### SURGICAL EXHIBITS

The ballroom of the Hotel Statler was reserved for the exhibits of the commercial houses as well as a few clinical demonstrations. The Collis P. Huntington Memorial Hospital, Pondville Hospital, Massachusetts Department of Public Health and the Palmer Memorial Hospital had excellent exhibits of photographs showing the pathology, methods of diagnosis and treatment of cancer. There was an elaborate collection of renal tumors with photographs and case histories prepared by the Massachusetts General Hospital.

Plastic surgery was well illustrated by the combined exhibit of Dr. V. H. Kazanjian and Dr. E. M. Daland. It depicted reconstruction of surface contours which had been destroyed by excision of tumors and severe burns as well as the elimination of congenital deformities. The various stages from beginning to end-result were shown by means of photographs and drawings.

Dr. Timothy Leary had a number of drawings illustrating the various stages in the development of a subdural hematoma. In the exhibit on poliomyeli-

tis the Children's Hospital included many interesting features such as appliances, end-results, and methods of correcting deformities. From the Brady Urological Institute of Baltimore came a variety of pathological specimens and some very good demonstrations of operative procedures.

## OFFICERS ELECTED BY THE NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

At the annual meeting of the above-designated institution, the following named officers were elected: Mrs. Augustus S. Nye, President; Mrs. Robert L. M. Underhill, first Vice-President; Miss Margaret Cummings, second Vice-President; Albert F. Seagrave, Assistant Treasurer and Mrs. John B. Osborn, Corresponding Secretary.

## THE NEW ENGLAND HEART ASSOCIATION

The first meeting of the New England Heart Association was held Monday evening, October 29, in the Ether Dome of the Massachusetts General Hospital. Dr. Paul White opened the meeting with a presentation of a number of old books of historical interest, and displayed two early stethoscopes.

Two cases of dissecting aortic aneurysm were presented. Dr. Glendy gave the clinical data and Dr. Castleman demonstrated the pathological specimens. Dr. White, who had diagnosed one of the cases clinically, gave a brief discussion and indicated three points of help in differentiating this condition and angina or coronary thrombosis. These were (1) the abrupt suddenness of maximum pain, (2) pain transmitted to the back and thighs, and (3) maintenance of high blood pressure.

The acute cor pulmonale, resulting from acute pulmonary embolism in some cases, was discussed by Dr. McGinn from the standpoint of accurate immediate diagnosis. Correct diagnosis is of course essential if the Trendelenburg operation of embolectomy is to be successful. In animals, the sudden occlusion of the pulmonary arteries leads to acute dilatation of the right ventricle, and this is probably also the case in human patients. The signs of this condition are cyanosis, apprehension, distention of the neck veins, air hunger, increased pulmonic second sound, gallop rhythm in the second and third left interspaces; in thin people a dilated pulmonary artery may be palpated, and there may be a friction rub in the second left interspace due to this dilated artery. In cats, the clamping of the pulmonary arteries produces a deep T wave in lead 2 and a lengthening of the P-R interval in the electrocardiogram. In human beings with pulmonary embolism, certain electrocardiographic changes are found which may prove of diagnostic value in the future, particularly inversion of QRS and T in lead 3.

Dr. Graybiel discussed seventy-two cases of complete heart-block (A-V type) and concluded that prognosis depends upon the etiology of the underlying heart disease. The duration of life in the coronary disease cases was about two years after the discovery of the block and was only half that time if intraventricular block was also present. Luetic heart disease carried an expectancy of four years. Rheumatic heart disease had a fair prognosis, and congenital conditions a good prognosis.

Dr. White discussed fifty-five cases of auricular fibrillation and flutter without heart disease; five of these showed flutter alone and two both flutter and fibrillation. Of the forty-nine cases of fibrillation twenty-three were under forty years of age when the trouble began, and twenty-six were over forty years. The mortality in these conditions is almost negligible in contrast to fibrillation plus heart disease where the duration of life averages relatively few years. Evidently these arrhythmias are in some cases merely exaggerated functional disorders, and are not, per se, an indication of heart disease.

Dr. Graybiel reported a study of the arterioles in five cases of coarctation of the aorta. This study was undertaken following a report that prolonged hypertension produces changes in the arterioles. In these cases no significant differences or changes were found in the histological picture of the arterioles in the muscle and skin of the arms and legs.

Dr. Sprague presented the Massachusetts General Hospital's series of nineteen cases of total thyroidectomy done for heart disease. Of these twelve were rheumatic, three hypertensive, two coronary with angina pectoris, one luetic, and one undetermined. At present seven are dead, one is unimproved, three are questionably improved, and eight are definitely improved. The early cases were more severe and carried a high mortality, but results in the more recent cases are encouraging. Dr. Sprague's opinion was that improvement was more likely in rheumatics without obvious congestive failure. He said that the greatest difficulty is in making a prognosis on the individual case.

Dr. Blumgart gave a brief discussion and indicated that operative mortality is being reduced to a very low level due to better surgical experience and the refusal to operate on terminal cases. Dr. Levine expressed the need for more series of cases such as this for better evaluation of results, and said that he personally felt more enthusiastic about patients with severe angina who feel well between attacks but whose life is made intolerable by the anginal pain.

## SOUTH END MEDICAL CLUB

At a meeting of the South End Medical Club on October 16, 1934, Dr. John B. Hawes, 2nd, spoke on "Important Points in the Diagnosis and Treatment of Pulmonary Tuberculosis."

Concerning the diagnosis in adults he emphasized the importance of constitutional signs and symptoms, the need of records of temperature and pulse, the significance of dry pleurisy and spontaneous pneumothorax as signs of tuberculosis and particularly that in perhaps fifty per cent of cases cough was conspicuous by its absence. In physical exam-

ination the most important point was persistent râles after cough. The sputum test was the only laboratory procedure of importance to the general practitioner. A negative sputum unless repeated many times was of little or no value. He urged an x-ray in every case.

For treatment he urged a stay in a sanatorium for part of the time at least in every instance and that all contacts should be x-rayed and all children given a von Pirquet test. In recommending treatment he urged considering not only dollars and cents but the happiness of the patient and the patient's family. The basis of modern treatment was prolonged rest of the patient in bed and rest of the lung by some form of compression treatment which should be done in at least seventy-five per cent of all cases.

He spoke of the dangers of ultraviolet light in lung disease. He warned against overfeeding the patient, and finally, spoke of the danger period in treatment, the six months to a year after the patient had left the sanatorium or finished active treatment, and urged monthly supervision at least.

Under the subject of chiidren he spoke of the changing ideas as to immunity. Formerly, it was considered rather a good thing for children to have a little tuberculous milk as it rendered them immune to the disease later on. This is now all changed. The present idea is to protect the human race from tuberculosis as far as is possible. He spoke of the attitude of Dr. A. J. Myers of Minnesota who regards all positive von Pirquet cases as active cases of tuberculosis. We do not go so far as that. He explained the first infection of the childhood type of tuberculosis as compared with the second infection or adult type of tuberculosis.

Treatment consists of rest in bed if there are signs of activity, local, in the lungs, or constitutional. He referred to collapse therapy in children and the value of shotbags for this purpose. He discussed the value of cod liver oil, heliotherapy and fresh air which children can stand so much better than adults. He urged subsequent supervision for an indefinite period.

Finally, he urged that the doctors consider the patient as a human being and not merely an interesting case of tuberculosis. He emphasized the need of practicing the art as well as the science of medicine.

## MASSACHUSETTS SOCIETY OF EXAMINING PHYSICIANS

FALL MEETING AND DINNER

The Copley-Plaza, Wednesday evening, November 14, 1934. Dinner at 7:00 P.M. sharp. $2.50 per plate.

Communications:

1. The Rôle of the Intervertebral Disk in Back Injuries. Dr. Joseph S. Barr, Visiting Orthopedic Surgeon of the Massachusetts General Hospital. This paper will be discussed by Dr. W. J. Mixter, Visiting Surgeon of the same hospital.

2. The Diagnosis of Industrial and Non-Industrial Skin Diseases. Dr. John Godwin Downing of the Boston City Hospital. To be discussed by Dr. Louis Schwartz, Senior Surgeon of the United States Public Health Service, New York.

FREDERICK WILLIAM O'BRIEN, M.D., *President*,
WILLIAM PEARCE COUES, M.D., *Secretary*.

## MASSACHUSETTS GENERAL HOSPITAL

CLINICAL MEETING

Thursday, November 15, 1934, Moseley Memorial Building, 8:15-10:00 P.M.

PROGRAM

Report from Osteomyelitis Clinic.

1. Presentation of Cases.

2. Modern Conception and Treatment of Osteomyelitis. Drs. Richard H. Miller and M. N. Smith-Petersen.

Physicians, medical students, nurses and social workers are cordially invited.

Committee on Hospital Meetings:
ARTHUR W. ALLEN, M.D., *Chairman*.
WILLIAM B. BREED, M.D., *Secretary*.

## SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the Headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, November 20, 1934, at 12 noon. The speaker will be C. Morton Smith, M.D., Emeritus Professor of Syphilology, Harvard Medical School; Member of Consulting Staff, Massachusetts General Hospital. His subject will be "Some Unusual Manifestations of Syphilis." All physicians are cordially invited to attend both lecture and luncheon.

## CLOVER HILL HOSPITAL

The next medical meeting of the Clover Hill Hospital will be held in the reception room of the hospital at 161 Berkeley Street, Lawrence, on Thursday evening, November 15, 1934, at 9 o'clock.

The speaker of the evening will be William J. Macdonald, M.D., of Boston, Dermatologist. His subject will be "A Timely Discussion of Stubborn Skin Diseases." Illustrated with lantern slides.

Discussion will follow and clinical cases will be shown. All physicians of Lawrence and vicinity are cordially invited to attend.

N. F. DECESARE, M.D., *Chairman*.

## BOSTON SOCIETY OF ANESTHETISTS

The next meeting of the Boston Society of Anesthetists will be held on Tuesday, November 13, at 8:00 P.M., at the Hotel Kenmore. Dr. Albert R. Behnke, of the Department of Physiology of the Harvard School of Public Health, will speak on "Oxygen

and Carbon Dioxide." All interested physicians are invited to attend.

PHILIP D. WOODBRIDGE, M.D., *President.*

## NEW ENGLAND ROENTGEN RAY SOCIETY

The November meeting will be held at the Boston Medical Library, Boston, Mass., Friday, November 16, 1934, at 8:15 P.M.

SCIENTIFIC SESSION

"Diaphragmatic Hernia and Associated Conditions." Dr. Philemon E. Truesdale, Dr. Joseph H. Marks.

RICHARD DRESSER, M.D., *Secretary.*

## BOSTON MEDICAL HISTORY CLUB

MONDAY, NOVEMBER 19

Pageant on the "Circulation and Respiration" given by students of Tufts College Medical School, under the direction of Dr. B. Spector.

Everyone is invited to attend.

JAMES F. BALLARD, *Secretary.*

## MASSACHUSETTS MEMORIAL HOSPITALS

There will be a meeting of the Surgical Section on Friday, November 9, 1934. The meeting will be held in the Ladies' Aid Room (former nurses' dining room), Talbot Memorial, 82 East Concord Street, at 12 noon.

Dr. Charles Sziklas will present a case and Dr. Lester R. Whitaker will present one of his cases.

Dr. Charles F. Branch will discuss both cases from the pathological viewpoint.

MILO C. GREEN, M.D., *Secretary.*

## HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance) Tuesday evening, November 13, at 8:15 P.M.

PROGRAM

Presentation of Cases.

Gastro-Intestinal Allergy and Its Diagnosis. By Dr. George Piness, Los Angeles, California.

New Concepts in Allergy with Especial Reference to Eczema. By Dr. Francis M. Rackemann, Boston, Massachusetts.

Dr. I. Chandler Walker will preside.

MARSHALL N. FULTON, M.D., *Secretary.*

## SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

**November 9**—William Harvey Society will meet in the Auditorium of the Beth Israel Hospital, Boston, at 8 P.M.

**November 9**—Massachusetts Memorial Hospitals. See notice above.

**November 9**—Phi Delta Epsilon Fraternity of Boston University School of Medicine will meet at the Evans Memorial Hospital Auditorium, 80 East Concord Street, Boston, at 8 P.M.

**November 13**—Harvard Medical Society. See notice above.

**November 13**—Boston Society of Anesthetists. See page 904.

**November 14**—Massachusetts Society of Examining Physicians. See page 904.

**November 14**—Post-Graduate Clinic Day. See page 897.

**November 15**—Clinic at the Peter Bent Brigham Hospital. See page 897.

**November 15**—Clover Hill Hospital. See page 904.

**November 15**—Massachusetts General Hospital. Clinical Meeting. See page 904.

**November 15 and 22**—Harvard Medical School. Lectures on "The Care of the Patient." Amphitheater C at 5 P.M. Thursday, November 15—Dr. Joseph H. Pratt of Boston. Thursday, November 22—Dr. Stephen Rushmore of Boston.

**November 16**—New England Roentgen Ray Society. See notice elsewhere on this page.

**November 19**—Boston Medical History Club. See notice elsewhere on this page.

**November 20**—South End Medical Club. See page 904.

### MASSACHUSETTS DIETETIC ASSOCIATION

**November 20**—Tuesday, 2 P.M. Field Trip: Visit Kitchens of the Hotel Statler.

**December 11**—Tuesday, 8 P.M. "Food Allergy," Dr. Frank N. Allan, Department of Medicine, Lahey Clinic.

**January 8**—Tuesday, 8 P.M. "Careers and Natural Abilities," Professor Johnson O'Connor, Human Engineering Laboratory, Stevens Institute of Technology, Hoboken, N. J.

**February 12**—Tuesday, 8 P.M. "Diabetic Children," Dr. Priscilla White, Joslin Diabetic Unit.

**March 12**—Tuesday, 8 P.M. "The Effect of Diet on Anemia," Dr. Lewis Diamond, Instructor in Medicine, Harvard University Medical School, Associate Physician, Children's Hospital.

**March 19**—Tuesday, 2 P.M. Field Trip: Visit Storehouse, First National Stores.

**April 9**—Tuesday, 8 P.M. "Small Hospital Problems," Miss Margaret Copeland, Superintendent, Free Hospital for Women.

**December 3-7**—The Radiological Society of North America. See notice on page 562, issue of September 20.

**December 6-8**—Annual Conference of the National Society for the Prevention of Blindness. See page 736, issue of October 18.

**April 29 - May 3, 1935**—The American College of Physicians will meet at Philadelphia. For information address Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

**June, 1935**—Medical Library Association will meet in Rochester, N. Y. For details address the Secretary: Miss Frances N. A. Whitman, Librarian, Harvard University Schools of Medicine and Public Health, Boston, Mass.

## DISTRICT MEDICAL SOCIETIES

### ESSEX NORTH DISTRICT MEDICAL SOCIETY

The Semi-Annual Meeting will be held in January and the Annual Meeting in May, time, place and subject to be announced.

E. S. BAGNALL, M.D., Secretary.

### FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of November, January, March, and May at the Weldon Hotel, Greenfield, Mass.

CHARLES MOLINE, M.D., Secretary.
Sunderland.

### MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

**November 14**—Reading.
**January 9, 1935**—Melrose.
**March 13, 1935**—Wakefield.
**May 8, 1935**—Winchester.

K. L. MACLACHLAN, M.D., Secretary.
1 Bellevue Street, Melrose.

### SUFFOLK DISTRICT MEDICAL SOCIETY

**November 28**—Meeting at the Boston Medical Library. Speakers: Dr. Frederick T. Lord, Dr. Edward D. Churchill, Dr. Roderick Heffron. Subject: Symposium on Pneumonia.

**January 23, 1935**—General Meeting in association with the Boston Medical Library. Speaker and subject to be announced later.

**March 27, 1935**—Clinical Meeting at the Boston Lying-In Hospital.

**April 24, 1935**—Clinical Meeting at the Children's Hospital.

The medical profession is cordially invited to attend all of these meetings.

ROBERT L. DeNORMANDIE, M.D., President.
GEORGE P. REYNOLDS, M.D., Secretary.
HENRY T. HUTCHINS, M.D., Boston Medical Library.

### WORCESTER DISTRICT MEDICAL SOCIETY

**November 14**—The November meeting will be held in the auditorium at the Grafton State Hospital. A buffet supper will be served to the members of the Society at 6:30 P.M., complimentary by the State Hospital. The business and scientific program will open at 7:30 P.M. The scientific paper will be presented by Dr. Walter Bauer of the Massachusetts General Hospital, Boston, and his subject will be "The Differential Diagnosis of Rheumatoid Arthritis." The second half of the evening's program will be less scientific than the first half and will consist of a non-scientific talking moving picture, presented by the Grafton State Hospital.

**December 12**—Wednesday evening. St. Vincent Hospital, Worcester, Mass. 6:30 P.M.: Dinner. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Dinner complimentary by the Hospital.

**January 9, 1935**—Wednesday evening. Worcester City Hospital, Worcester, Mass. 6:30 P.M.: Buffet supper. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Buffet supper complimentary by the Hospital.

**February 13, 1935**—Wednesday evening. Worcester State Hospital, Worcester, Mass. 6:30 P.M.: Dinner. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Dinner complimentary by the Hospital.

**March 13, 1935**—Wednesday evening. The Memorial Hospital, Worcester, Mass. 6:30 P.M.: Buffet supper. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Buffet supper complimentary by the Hospital.

**April 10, 1935**—Wednesday evening. Worcester Hahnemann Hospital, Worcester, Mass. 6:30 P.M.: Dinner. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Dinner complimentary by the Hospital.

**May 8, 1935**—Wednesday afternoon and evening. Annual Meeting of the Worcester District Medical Society. The time and place of this meeting will be announced later.

ERWIN C. MILLER, M.D., Secretary.
27 Elm Street, Worcester.

## BOOKS RECEIVED FOR REVIEW

**The Anatomy of Surgical Approaches.** By L. C. Kellogg. 134 pp. Baltimore: William Wood & Company. $1.50.

**Physical Diagnosis.** By Richard C. Cabot. Eleventh Edition. 540 pp. Baltimore: William Wood & Company. $5.00.

**Electrocardiography.** By Chauncey C. Maher. 250 pp. Baltimore: William Wood & Company, 1934. $4.00.

**An Activity Analysis of Nursing.** By Ethel Johns and Blanche Pfefferkorn. Prepared under the auspices of the Committee on the Grading of Nursing Schools. 214 pp. New York: The Nursing Information Bureau of the American Nurses' Association. $2.00.

**Nursing Schools Today and Tomorrow.** Final Report of the Committee on the Grading of Nursing Schools. 268 pp. New York: The Nursing Information Bureau of the American Nurses' Schools. $2.00.

**Wish-Hunting in the Unconscious. An Analysis of Psychoanalysis.** By Milton Harrington. 189 pp. New York: The Macmillan Company. $2.50.

**Hygiene for Freshmen.** By Alfred Worcester. 151 pp. Illinois: Charles C. Thomas. $1.50.

**Tuberculosis of the Lymphatic System.** By Richard H. Miller. 248 pp. New York: The Macmillan Company. $4.00.

**Lincoln's New Salem.** By Benjamin P. Thomas. 128 pp. Springfield, Illinois: The Abraham Lincoln Association, 1934. $1.00.

**Applied Anatomy. The Construction of the Human Body Considered in Relation to Its Functions, Diseases and Injuries. Ninth Edition.** By Gwilym G. Davis. 717 pp. Philadelphia, London, and Montreal: J. B. Lippincott Company. $9.00.

## BOOK REVIEWS

**History of the University of Edinburgh, 1883-1933.** Edited on behalf of the History Committee by A. Logan Turner. 452 pp. Edinburgh & London: Oliver & Boyd, 1933.

A few years ago, the University of Edinburgh celebrated the three hundred and fiftieth anniversary of its foundation. The story of this great teaching center was told in a previous volume issued in 1884, at the time of the tercentenary celebration. The present book reviews the last fifty years and covers all the faculties, including medicine and science. During the period, in medicine, the staff has increased from twelve professors and two lecturers to nineteen professors and forty-eight lecturers, with many other associated assistants. A list of the previous occupants of the various chairs and their present holders is given, with a few photographs of the more important members of the faculty, the outstanding member being, of course, Lord Lister. The book is beautifully produced and is a distinct addition to the history of one of the greatest of our universities.

**Modern Treatment in General Practice.** Edited by Cecil P. G. Wakeley. 426 pp. Baltimore: William Wood and Company. $4.00.

This volume is especially published for the general practitioner and certainly these members of the profession will welcome a book which discusses such subjects as "Treatment of Diabetic Coma," "Acute Circulatory Failure," "Infections of the Hand" and fifty-two other subjects in a brief yet practical and inclusive manner. Each article is written by a specialist in that particular field, and the book is a collection of individual papers first published in "The Medical Press and Circular" in England.

The title of the book is somewhat of a misnomer in that procedures such as "Exposing the Brain and Its Meninges" could not be handled by the general practitioner without outside aid, but, like many other articles, this also introduces the physician to the new methods in the larger clinics to which he can refer his patients for treatment.

The book is well edited and contains a number of illustrations.